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CARBIDE AND CARBON CHEMICALS CORPORATION
K-25 PLANT
CAK RIDGE, TENNESSEE

REPORT OF HEALTH PHYSICS ACTIVITIES
FOR
JANUARY, 1948

Compiled by S. Visner

Classification Changed to UNCLASSIFIED

By Authority of PGD-4

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By R. B. Martin, Analyses Corp. 8-30-89

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Report Number K-178, Part 1

Title:

Report of Health Physics

Activities at K-25 Plant

for January, 1948

Date of Issue February 20, 1948

Author: S. Visner

CARBIDE AND CARBON CHEMICALS CORPORATION

K-25 Plant

Oak Ridge, Tennessee

SUMMARY

Herein is presented a report of Health Physics activities in the K-25 Plant for January, 1948. Radiation surveys, area and personnel monitoring, air sampling, and laboratory analysis of water are reported. Development work on instrumentation for radiation detection and special problems involving radiation hazards control are described.

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I. INTRODUCTION

Continued improvement is being manifested in the extent of radiation monitoring and also in the procedures for reporting and recording radiation monitoring data.

The tolerances for radiation and radioactive contamination remain as listed in the report for December, 1947.

Radiation surveys were made throughout the plant in locations where radiation and radioactive contamination were possible. Several locations were found in the Process Area and Maintenance Shops where decontamination was called for. There is a continued need for the use of protective equipment during specific operations in the Feed and Waste Buildings and also while maintaining process equipment.

The educational program was continued which consisted of lectures on radioactive hazards and precautions and operation of radiation detection instruments.

A survey was made of radiation survey instruments requirements for the first quarter of 1948 and orders were placed.

Two noteworthy incidents occurred in which radioactive material was released. On January 8, 1948, a spill of radium occurred in opening a leaky radium source. The area was isolated until decontamination was effected and the personnel involved were sent to the Dispensary. Periodic inspection of all radium sources will be made. A process material spill took place in the Waste Removal Building on January 31, 1948, caused by a ruptured flexible line. Personnel in the area were sent to the Dispensary and the area was decontaminated.

II. ORGANIZATION

The Health Physics group in the Radiation Hazards Department has been reorganized into two sections:

- (6) The Health Physics Inspection Section which includes a section head and four (4) health surveyors. The functions of this section are to conduct spot checks throughout the plant for radiation hazards, and also to audit the radiation monitoring data submitted by the operating groups.
- (B) Health Physics Technical Section which consists of three (3) technical men. Their functions include the following:
 - 1. To advise line organization on tolerance specifications and on problems involving radiation hazards.
 - 2. To review surveys made by the Health Physics Inspection Section for possible recommendations and suggestions.
 - 3. To coordinate radiation survey instrument development and procurement in the plant.

- 4. To perform calculations on shielding and tolerances.
- 5. To conduct educational programs on radioactivity hazards precautions.

It is to be pointed out that the monitoring of radiation is performed both by the operating groups and the Health Physics Sections of the Radiation Hazards Department.

III. RADIATION HAZARDS SURVEYS

Routine surveys were conducted in the plant during the month of January for the purpose of locating above-tolerance radiation and contamination and also for providing a record of radiation and cleanliness levels. All locations with above-tolerance contamination found on these surveys are usually decontaminated.

The locations for which results of such surveys are formally reported are as follows:

40 101101101	Alpha	Be ta	Air
Location	Surfaces	Ga mma	Samples
K-25*and K-27 Process Operating Floor	Weekly		On request
K-131 Feed Room	Weekly	Daily	Twice Weekly
K-631 Tails Withdrawal	Weekly	Daily	Twice Weekly
K-101-C-816 Stripping Building	Twice Monthly	ு ⊶	On request
K-306-7 S. S. Area	Weekly		Daily
K-300 R. R. Area	Monthly	ന ്ന യ	On request
K-300 Instrument Shops	Twice Monthly	None Required	On request
K-300 Maintenance Operations	All Jobs	None Required	All Jobs
K-1004 Laboratory A Sampling Section Physics Research	Weekly As required	As required As required	33 au 46 au 46 au
K-1004 Laboratory B Analysis Section Counting Section	Weekly Weekly	As required	
K-1004 Laboratory C Physics Section	Weekly		
K-1004 Laboratory D	UN	ICLASSIFIE	LU .
Research Laboratories	Weekly	As required	Weekly

Location	Alpha Surfaces	Be ta Gamma	Air Samples
K-1301 Conversion Room	Weekly	Weekly	3 Times a Week
K-1303 Decentamination Room	Weekly	Weekly	3 Times a Week
K-1405 Engineering Development	Monthly	** ** ** ** * * * * *	Twice Weekly
K-1401 Vacuum Pump Shop	Daily	None Required	Monthly
K-1401 Seal Shop	Daily	None Required	Monthly
K-1401 AC Pump Shop	Daily	None Required	Monthly
K-1401 Valve Shop	As Required	None Required	As Required

In accordance with its responsibility, the Radiation Hazards Department conducted spot surveys on an irregular schedule.

The results of routine surveys made or authorized by the operating groups and the results of the spot checks made by the Health Physics Section are presented under sub-captions for each location involved:

K-101 -- C-816 Stripping Building

Routine Surveys (Operating Group):

Two (2) routine surveys were conducted this month. Nine (9) of the alpha surface readings were above tolerance. A maximum reading of 4212 alpha c/m was found on the floor with possible transfer of 2340 alpha c/m.

Spot Surveys (Radiation Hazards Department):

A survey revealed four (4) above-tolerance readings. A maximum of 36,240 alpha c/m was found on a Welch pump. It was possible to transfer 906 alpha c/m of this material. The contaminated Welch pump was replaced. Protective equipment in form of gloves and masks are used during sampling operations, cylinder connecting and disconnecting.

All above-tolerance locations were decontaminated, and the combination of safety equipment worn during hazardous jobs with decontamination as needed is believed sufficient to insure the safety of personnel.

K-131 -- Feed Purification Building

Routine Surveys (Operating Group):

Five (5) alpha surveys were made during the month of January in which seventeen (17) readings were above tolerance. The majority of above-tolerance readings are on and around feed cylinder baths. A



reading of 1/186 alpha c/m was found on the floor at "A" bath with possible transfer of 247 alpha c/m. A count of 2973 alpha c/m was found on a wrench on the "A" bath. It was possible to transfer 123 alpha c/m of this material. All beta and gamma radiation was below tolerance.

Spot Surveys (Radiation Hazards Department):

Spot surveys conducted here disclosed several above-tolerance a conditions. High readings were found chiefly in the vicinity of feed cylinder baths. This can be attributed to the operation of connecting and disconnecting cylinders in baths. All beta and gamma radiation was below tolerance, as were all air samples. Mask and gloves are worn when disconnecting or connecting, and sampling cylinders.

K-631 -- Waste Disposal Building

Routine Surveys (Operating Group):

Three (3) surveys were made prior to January 30, 1948. Only four (4) of the readings were above tolerance. A maximim of 2274 alpha c/m was found in floor drain which emptied into the storm drain system. A reading of 1516 alpha c/m was found on scales.

Spot Surveys (Radiation Hazards Department):

Above-tolerance conditions did exist here on January 31, 1948, at the time of a major material release. (See Process Material Release Section.) Spot surveys conducted prior to January 31, 1948, disclosed above-tolerance readings as high as 3349 alpha c/m on the floor at the sample point with possible transfer of 394 alpha c/m. All air samples were below tolerance. Mask and gloves are worn during sampling operation and connecting and disconnecting cylinders.

Both the K-131 and K-631 Buildings are decontaminated as often as necessary to maintain safe working conditions. The presence of an occasional above-tolerance count does not indicate inadequate safeguards (since safety equipment is worn on the contaminated jobs) but rather the need for continued thorough periodic clean-up.

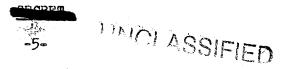
K-300 Buildings -- Plant III -- R. R. Area

Routine Surveys (Operating Group):

One (1) survey was made this month, which revealed several abovetolerance spots in a work shop at K-304-5, formerly occupied by a maintenance facility. The location had been decontaminated prior to this survey, and further steps will be taken to eliminate the hazard. The shop is locked and unused at the present time.

Spot Surveys (Radiation Hazards Department):

Spot surveys conducted disclosed several above-tolerance conditions



in the R. R. Area. In the K-312-3 Cold Trap Room, a maximum reading of 19910 alpha c/m was found on the floor with possible transfer of 1048 alpha c/m. In K-312-3, Cell 10, a reading of 39,024 alpha c/m was found on the cell floor. It was possible to transfer 7317 alpha c/m of this material. In K-312 Basement a maximum reading of over 60,000 alpha c/m was found on #2 Valley Iron Works pump base in K-312-1, Cell 7. It was possible to transfer 36,530 alpha c/m of this material. Decontamination has been requested by supervision on all above-tolerance conditions. Most of this activity is an accumulation of material which occurred prior to the language of radiation surveys.

K-300 -- Coded Chemicals Vaults

Spot Surveys (Radiation Hazards Department):

A high level of alpha surface activity was present in the 16-A Wault. The problem is now being considered of establishing procedures for the use of protective equipment operations in this locale. Further decontamination will be instituted and an investigation will be started to determine the necessity for a hand counting program.

In Vault 17-A a maximum reading of 16086 alpha c/m was found on the floor. It was possible to transfer 2178 alpha c/m of this material. This contamination can be attributed to a contaminated carbon sampler used here. Operating personnel wear gloves, coveralls and masks during sampling operating. Shoe protection is being considered.

A survey in 1-X Vault revealed only one (1) above-tolerance reading. This was one a stored product cylinder head, known to be active.

A survey in 8-A and 15-A Vaults revealed a few readings just above tolerance, but not transferable.

K-300 -- Maintenance Shops in the Process Area

1. Instrument Shops

Spot Surveys (Radiation Hazards Department):

During the month of January, spot checks were made in Instrument Shops in K-301-4, K-303-7, K-305-9, K-305-10, and K-402-9. No above-tolerance activity was found, indicating the desirability of continuing the existing policy of decontaminating all equipment before starting repair work.

2. Process Maintenance Shops

Routine Surveys (Operating Group):

Surveys were made in the following shops: K-301-5, K-302-1, K-302-3, K-302-5, K-303-1, K-309-3, K-310-1, K-311-1 and K-402-9.



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No above-tolerance activity was found.

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were made of the above locations which verified the findings of the Operating Group.

3. K-312-2 Valley Iron Works Pump Shop

Moutine Surveys (Operating Group):

Alpha surface readings disclosed activity up to 3500 counts per minute of floors and tables.

Spot Surveys (Radiation Hazards Department):

Activity up to 9300 counts per minute was found on equipment, with floor and table readings agreeing closely with the Routine Survey results. Atmospheric counts were below tolerance.

This condition is undoubtedly caused by both past accumulation and present work in this locality. Some hand counts were found to be high, but all were eliminated by washing after the spot checks. This area will be decontaminated, and a complete study will be made to determine the best method of eliminating or controlling further contamination. The shortage of radiation instruments has prevented the establishment of a hand counting program in this locality.

K-311-1 through K-301-5

Routine Surveys (Operating Group):

Five (5) surveys were made this month. Only one reading was above tolerance, which was 6,240 alpha c/m on the upper evacuation valve in K-309-2, Cell 2. This was immediately decontaminated.

Spot Surveys (Radiation Hazards Department):

Spot surveys conducted in this area indicated below tolerance conditions with the exception of 1100 alpha counts per minute on the Line Recorder sample manifold in K-301-3. Protective equipment against alpha emitting contamination is used during sampling operations, and decontamination effected on above-tolerance activity.

K-302-1 through K-303-10

Routine Surveys (Operating Group):

Six (6) surveys were made this month. The majority of the above-tolerance readings were at K-303-9, the former location of the Product Withdrawal unit. This location was decontaminated. A reading of 2,350 alpha c/m was found on the floor in K-303-8, Line Recorder Station, and was removed by decontamination.





Spot Surveys (Radiation Hazards Department):

A survey conducted here revealed no above-tolerance readings in Line Recorder Stations. In K-302-5 Cold Trap Room, several above-tolerance readings as high as 5976 alpha c/m were found on the cylinder connection to "A" Cold Trap. It was possible to transfer 3984 alpha c/m of this material. A maximum reading of 4,382 c/m with possible transfer of 784 alpha c/m was found on the floor cutside the Cold Trap Room. This contamination is probably due to maintenance work on Beach Russ Pumps here recently. Decontamination will follow. Mask and gloves are used during cylinder connecting, disconnecting and sampling operations.

K-304-1 through K-305-11 -- Process Operating Floor

Routine Surveys (Operating Group):

A total of ten (10) surveys were made this month. A maximum reading of 20,820 alpha c/m was found on Line Recorder sampling manifold at K-304-2. It was possible to transfer 2496 alpha c/m of this material.

Spot Surveys (Radiation Hazards Department):

Above-tolerance readings as high as 4,978 alpha c/m were found on the floor outside K-305-2 Line Recorder Station. It was possible to transfer 450 alpha c/m of this material. All high readings are being followed up by decontamination. Protective equipment in form of gloses and masks are used during sampling operations.

K-305-12 through K-312-3 -- Process Operating Floor

Routine Surveys (Operating Group):

Three (3) spot surveys were conducted during the month of January. A maximum reading of 23,155 alpha c/m was found on a mechanical vacuum pump in K-305-12 Line Recorder Station. The pump was replaced, and will be decontaminated prior to overhaul.

Spot Surveys (Radiation Hazards Department):

Spot surveys conducted revealed above-tolerance readings as high as 12,000 alpha c/m inside Line Recorder manifold housing in K-306-3. This does not constitute a hazard since the housing is open only during maintenance work inside, and then the Maintenance men are equipped with protective equipment. A reading of 3439 alpha c/m was found of floor under manifold pump in K-306-2 Line Recorder Station. Contaminated pumps are replaced. Protective equipment in the form of masks and gloves are used during sampling operations. These measures appear to be sufficient to safeguard personnel.

All process area locations which have above-tolerance alpha count are decontaminated as soon as possible after the location of





such activity. A large part of the contamination is the result of the gradual accumulation of material from past minor spills and it is anticipated that some contamination will be found through further surveys. Decontamination will remove, or paint will cover such locations, and the problem will resolve itself into one of cleaning up after each spill or release, to maintain below-tolerance alpha activity and to safeguard personnel.

K-306-7 -- S. S. Area

Routine Surveys (Operating Group):

Three (3) surveys were made in the Product Withdrawal Station. A maximum reading of 2860 alpha c/m was found on stand "B" with 1560 alpha counts transfer A reading of 2080 was found on gloves used by weighing room personnel. Gloves were replaced.

Spot Surveys (Radiation Hazards Department):

Surveys conducted here revealed above-tolerance readings up to 1936 alpha c/m on the cylinder defroster in the Product Withdrawal Station. It was possible to transfer 242 alpha c/m of this material. A cylinder in product storage room had a reading of over 60,000 alpha c/m, although the cylinder had been decontaminated. None of the material was transferable. The Product Withdrawal Operators were wearing masks and gloves when withdrawing product cylinders. A hand counting program is in effect here. The floor of Product Withdrawal Room is being covered with stainless steel to simplify decontamination. All high readings are followed by decontamination.

K-300 -- Process Area Maintenance Jobs

AC Pump Work and Seal Changes

Routine and Spot Surveys (Operating Group and Radiation Hazards Dept.):

A total of thirteen (13) seal changes and one (1) pump change job were monitored, and in each case the results followed the pattern described below:

- 1. Seals removed -- up to 50,000 alpha c/m, both fixed and transferable.
- 2. Gloves used -- up to 20,000 counts.
- 3. Tools -- up to 10,000 counts.
- 4. Floor around pump -- ranged from 0 to 3000 counts.
- 5. Atmospheric contamination -- occasionally as high as 400 alpha counts per minute per cubic foot, or 200 times the tolerance for continuous exposure.





Masks and gloves are specified for this work, and further study will be conducted on the necessity for segregating contaminated tools and disposal of contaminated gloves. Hand counts were occasionally above tolerance, but in each instance, washing removed the count. Strict adherence to the regulation requiring use of gloves and other safety equipment throughout the seal or pump change job is the best method of eliminating personnel contamination. Hand counting is being considered.

K-402-1 through K-402-9

Routine Surveys (Operating Group):

Three (3) surveys were conducted in which readings as high as 8,670 alpha c/m were found on the floor of the portable feed unit in K-402-4. A maximum reading of 8,436 alpha c/m was found on the floor around K-402-4 feed filters.

Spot Surveys (Radiation Hazards Department):

A survey revealed that the process operating floor is below tolerance with the exception of 2,856 alpha c/m on K-402-1 Line Recorder sampling manifold. Several above-tolerance readings were found in the vicinity of the K-402-4 feed filter. The cause of this contamination was probably a material release at this location in the past. Decontamination was started immediately. Protective equipment in the form of gloves and masks are used during Line Recorder sampling operations.

E-1004 -- Laboratories

Routine Surveys (Operating Group):

Formal reporting of operating survey results from the Laboratory Division remained indefinite during January. Full tabulations are not available, but the weekly survey results have been scanned, and contamination levels in general are low.

It is noted that the hot spot on the floor in Room 104, Laboratory B, reported last month, has been successfully decentaminated.

A salvage cart used in Laboratory B was found to build up rapidly to above tolerance values after decontamination. The cart was rebuilt, to allow its work surfaces, designed as removable trays, to be washed daily to keep it below the tolerance level.

Spot Surveys (Radiation Hazards Department):

Laboratory B, Room 122 -- January 15, 1948

Surface alpha readings with a Victoreen 356 alpha meter were made throughout the room, with emphasis on the newly installed furnace hoods.



Of seventy-two (72) surface readings, sixty-four (64) were zero (0) while the remainder were below surface tolerance, except for one (1). This, a spot on a hood work surface, read 1450 c/m surface and 1015 c/m on a wipe test. This was immediately cleaned.

The new hoods in this Laboratory were designed and installed to prevent the possibility of uranium-bearing fumes from combustion furnaces contaminating the atmosphere. Airborne alpha samples taken under former operating conditions indicated localized high atmospheric activity during some operations. The new hoods totally enclose these furnaces, allowing access to their doors and controls through small front openings. Retesting of this area for airborne alpha is planned as soon as operating conditions arise which are similar to those of the former tests.

Laboratory D, Room 22 -- January 15, 1948

Of approximately sixty (60) alpha surface readings in this room, four (4) gave significant readings, one of which was above tolerance. The top of an oven showed 1015 surface counts per minute, and zero (0) wipe test. All other wipe tests were zero (0).

A sample stored in a bottle in a wall cabinet, gave a beta-gamma count of 0.042 R/8 hours at the bottle surface. A general room check showed no other beta-gamma activity above background.

Laboratory B, Room 104 -- January 19, 1948

Approximately twenty-five (25) alpha surface readings on shelves and bench tops throughout the room were below tolerance. The work surface inside one (1) hood showed surface activity up to 1100 c/m; zero (0) results on a wipe test.

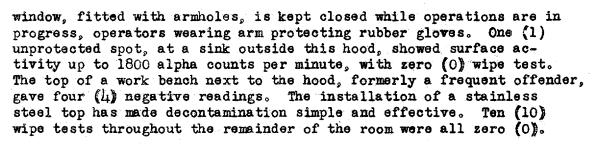
The floor throughout the room showed no activity, except for one spot near the center bench which gave readings up to 14,000 c/m, zero (0) wipe test results. This spot was later successfully decontaminated (see Operating Surveys above).

Laboratory B, Room 108 -- January 19, 1948

Approximately thirty (30) below-tolerance alpha surface readings were obtained on the floor, benches and equipment. The only positive results appeared on a sink drainboard in the Southwest corner of the room. Dry areas, where alpha surface readings were possible, read up to 1300 c/m, with zero (0) wipe test.

Laboratory B, Room 105 -- January 20, 1948

Of approximately sixty-five (65) alpha surface readings on bench tops, floor shelves, and equipment, only fifteen (15) positive results were obtained. These were all in and around the knockout hood, which is a known hot spot where special precautions are observed. A special hood



Laboratory B, Room 114 -- January 22, 1948

Approximately thirty (30) alpha surface readings in the counting room, where loose uranium salts are not ordinarily handled, were all zero. Five (5) negative wipe tests were made.

Laboratory D, Room 17

Of seventy-three (73) alpha surface readings taken, sixty-seven (67) were zero, five (5) below surface tolerance, and one (1), the floor near a special operation, was 1000 counts per minute. No significant wipe test results were observed from twenty-eight (28) tests.

Laboratory D, Room 23 =- January 30, 1948

A beta-gamma survey was made to check the safety of storage and handling procedures for a twenty-five milligram radium needle. It was found that present procedures are safe, but not "fool proof", as above tolerance intensities exist within six inches (6") of the operation shield and within ten inches (10") of the storage container. When not in use, the container is stored in a classified safe outside which radiation intensities are below tolerance. While in use the operation is carried out in a closed room which employees are not permitted to enter. While over-tolerance exposures are theoretically possible under such conditions, the actual probability of any employee remaining within the six (6) and ten (10) inch distances long enough to incur an over-tolerance dose is negligible. Increased shielding thiskness has been recommended, however, to insure complete safety at all times. The posting of signs to warn of the presence of radium, and the safe distances, has been recommended.

K-1024 -- Instrument Shops

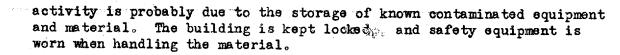
Routine and Spot Surveys (Operating Group and Radiation Hazards Dept.):

No above-tolerance readings were found in two (2) alpha surveys except on the occasion of a radium spill which is reported in the "Material Release" section.

K-1031 -- Contaminated Carbon and Equipment Storage Building

Spot Surveys (Radiation Hazards Department):

A maximum reading of 2437 alpha c/m was found on the floor. This



K-1301 -- C-216 Generation Unit and Oxide Conversion Building

Routine Surveys (Operating Group):

A total of five (5) surveys were conducted this month. Above-tolerance readings were obtained in the conversion room. A maximum of 17,250 alpha c/m was found on "B" reactor with possible transfer of 6900 alpha c/m. Beta and gamma radiation readings taken were below tolerance.

Spot Surveys (Radiation Hazards Department):

Surveys conducted revealed above-tolerance conditions exist in the oxide conversion room, weighing room and sampling room. Personnel working in these locales use protective equipment in the form of coveralls, special shoes, gloves and respirators. Signs are posted specifying that proper protective equipment is to be used. A hand counting program is in effect. No smoking or eating is permitted in the above locations.

K-1303 -- Decontamination Building

Routine Surveys (Operating Group):

Five (5) surveys were performed during the month of January.

The majority of high readings were in the vicinity of the decontamination tanks. A maximum reading of 40,351 alpha c/m was found on a wood platform. Transferable activity ranged up to 5978 alpha c/m. All beta-gamma radiation was below tolerance.

Spot Surveys (Radiation Hazards Department):

Surveys conducted in this building disclosed above-tolerance contamination in this area. Personnel are required to wear protective equipment in the form of gloves, shoes, coveralls, and respiratory protection when necessary. As stated in the December, 1947 report, the new decontamination equipment is under development. A hand counting program is in effect. Signs are posted as to proper protective equipment to be worn. Smoking or eating is not permitted in the decontamination room.

K-1401 -- Maintenance Building

1. Scrap Property Enclosure

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were made this month in which no alpha activity



was detected. A poppy alpha meter is used in this location to determine whether any activity exists on unwanted equipment, in order to determine its dispostion.

Since no known contaminated items are delivered to this enclosure, the likelihood of contamination is slight.

2. Cleaning Area

Spot Surveys (Radiation Hazards Department):

In two (2) spot checks this month, the only alpha activity found was on two (2) process cylinders. These had up to 5000 alpha counts per minute, and were returned for further decontamination.

Although decontaminated items, which are still alpha active, are brought here for further cleaning, it is anticipated that improvements in routing and more thorough radiation checks, will eliminate such instances.

3. Seal Shop

Routine Surveys (Operating Group):

More than 2790 alpha readings were taken during this month on work surfaces, floors and equipment. Only 24 surface readings were above tolerance, the highest being 19,000 counts, with the average approximately 2000. Contaminated seals are stored in this area awaiting decontamination. Readings on these seals are as high as 50,000 alpha c/m, with as much as 30,000 counts transferable. One (1) pair of leather gloves, used specifically to stack these seals, had 20,000 counts and was subsequently discarded. (See "Hand Count" Section.)

Spot Surveys (Radiation Hazards Department):

Four (4) spot checks confirmed readings taken by the operating group. Since this shop is now working on new equipment, the isolated contaminated spots can be ascribed to past work, and are being decontaminated.

The only hazard involved is that of accidental handling of contaminated seals, and since this is a restricted entry area, and active seals are identified and stored in one corner, contamination from this source is improbable.

4. Valve Shop

Routine Surveys (Operating Group):

Two (2) surveys were taken during the month, with no above tolerance conditions being found.

Spot Surveys (Radiation Hazards Department):

No activity was found in this shop except on several valves which had not been decontaminated prior to routing to this shop. The existing procedure is to route contaminated valves first to Decontamination. It is necessary that misrouting of equipment be rectified.

5. Vacuum Pump Shop

Routine Surveys (Operating Group):

Daily readings were taken of locations where work was in progress. Several locations were contaminated to 1400 counts, with 800 transferable.

Spot Surveys (Radiation Hazards Department):

A number of vacuum pump parts were found to be contaminated, beyond 50,000 surface and 12,000 wipe counts, but since these items were known to be contaminated, protective equipment was worn while handling them. Two (2) table tops were contaminated up to 2,000 counts. Isolated contaminated locations on the floor were cleaned up, and alpha active table tops painted over.

A solution to the contaminated problem in this shop is to degrease, decontaminate, and disassemble contaminated pumps in an isolated area. This problem is being studied to determine the feasibility of such a revision in procedure. (See "Hand Count" Section).

H-1410 Carbon, Alumina Handling Building

Spot Surveys (Radiation Hazards Department):

A survey conducted disclosed above-tolerance readings up to 2,900 alpha c/m on the floor in the vicinity of the carbon and alumina separator. This activity can be attributed to the contaminated carbon separator machine. Adequate protective equipment is specified when the equipment is run or material handled.

K-1405 -- Engineering Chemical Development Building

Routine Surveys (Operating Group):

One (1) survey was made this month. Three readings were above tolerance. The highest reading being 2835 alpha c/m, found on the floor.

Spot Surveys (Radiation Hazards Department):

Surveys conducted here revealed above-tolerance readings as high as 2860 alpha c/m on the floor. It was possible to transfer 330 alpha c/m of this material. Due to work performed here above tolerance surface alpha contamination is expected and operating personnel are aware





of this. All beta-gamma radiation was below tolerance. Protective equipment in the form of gloves and coveralls are worn, and in certain experimental operations, respiratory protection is used. A hand counting program is being started.

Since the operations are of an experimental nature, using temporary set-ups, some material is unavoidably spilled at times. The area is frequently decontaminated to prevent any build-up of material.

IV. PERSONNEL MONITORING

Hand Counts

K-306-7 -- Product Withdrawal Station

Hand, shoe, and clothing counts are taken daily; before lunch and at the end of the shift. No readings above tolerance were reported on shoes and clothing. Hand count, in one instance, was above tolerance but after two (2) washes, a below-tolerance reading was obtained.

K-1004- A and B -- Laboratories

Two (2) sets of hand counts are taken each day-before lunch and at the end of the shift-of all employees in Laboratories A and B. Approximately fifteen (15) employees are checked in Laboratory A and fifty-five (55) employees in Laboratory B.

Only three (3) instance of above-tolerance counts occurred, and in each case a single remash brought the count down to acceptable values.

K-1300 -- Area Change House

Hand counts are taken daily at lunch time and at the end of the shift. All final hand counts were below tolerance.

K-1401 -- Maintenance Shops

Both the Vacuum Pump Shop and combined Seal and AC Pump Shop continue as the only locations in the Maintenance Division taking regular hand counts before lunch and at quitting time.

No above tolerance condition was reported this month.

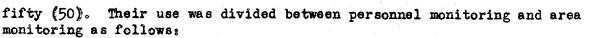
Other locations will institute hand counts as instruments become available.

Film Badges

Program

During the month of January approximately one hundred and fifty (150) film badges per week were issued throughout K-25, an increase of about





	Stationary	Personnel
Process Division	142	28
Laboratory Division	7	19
Instrument Development Section	•	4
Critical Mass Laboratory	5	9
Pilot Plant	5	2
Emergency Monitors	-	11
Radiations Hazards Department		5

In addition, four (4) special Neutron films were used each week during the month in stationary locations in the Works Laboratory and the Critical Mass Laboratory.

Results

Film Badge results indicate no over-tolerance exposure to personnel during the month of January.

V. PROCESS MATERIAL RELEASES

After each spill, the area is monitored for contamination, and decontamination is affected, if necessary,

K-101 -- C-816 Stripping Building -- January 5, 1948

A release of approximately three (3) hours duration occurred when a minute leak developed in a process line. Four (4) men present reported to the Dispensary.

K-631 -- Tails Withdrawal Room -- January 31, 1948

A major release of material occurred when the flexible hose connection to #2 waste cylinder ruptured. Two (2) men involved reported to the Dispensary, and decontamination was started immediately.

K-301-3 -- Process Building, Line Recorder -- January 5, 1948

A small material release occurred when a C-616 sample cylinder was being disconnected. Four (l_1) men involved reported to the Dispensary.

K-302-1 -- Process Building, Line Recorder -- January 30, 1948

A minor material release of less than one minute duration occurred



as a Hoke sample tube was disconnected. Four (4) men involved reported to the Dispensary.

K-305-1 -- Process Building, Line Recorder -- January 6, 1948

A one minute material release occurred while disconnecting a C-616 sample cylinder. Six (6) men present reported to the Dispensary.

K-306-7 -- Product Withdrawal Station -- January 5, 1948

A small release of material was caused by a leak in the gasket of a product cylinder. The cylinder was in an exhaust hood, and the operator was standing away from the hood, wearing safety equipment. It was not deemed necessary to send any personnel to the Dispensary.

K-306-7 -- Product Withdrawal Station -- January 16, 1948

A small release occurred while a product cylinder was being connected from "B" Stand. It was determined that there was a negligible possibility of exposure since no persons were in the immediate vicinity, and an exhaust hood was in operation over the connection. Safety equipment was worn at the time. No one was sent to the Dispensary.

K-309-2 -- Process Building, Line Recorder -- January 16, 1948

A small material release occurred when a Welch vacuum pump was started It was determined that no personnel were in the immediate vicinity. No one was sent to the Dispensary.

K-402-6 -- Process Building, Line Recorder -- January 22, 1948

A small material release occurred when a Line Recorder rack was disconnected. One man present reported to the Dispensary.

K-1024 -- Electronic Instrument Shop Office -- January 8, 1948

A 1.17 mg. radium source was found to be contaminating the hands of persons using it. The container was opened in the shop office, and at that time the glass needle contaminating the radium was found shattered. The material then fell on a sheet of paper covering the desk over which the inspection was carried out. Alpha readings on the desk on which the source was opened were greater than 67,500 counts per minute, with an air count of 9.6 alpha counts per cubic foot per minute, and beta-gamma activity of .324 r/8 hr. at 12 inches. Twelve (12) persons were sent to the Dispensary All surfaces were completely decontaminated, and the source was transferred to a safe location.

VI. WATER SURVEY PROGRAM

During the month of January, 1948, the water survey program continued according to the schedule established at its inception in October, 1947. Several refinements in the counting of samples have been introduced wherein controls are run in order to determine the limit of error. Also difficulties arising from





adjacent radium sources have been minimized. Analyses for uranium were made on samples from all locations and for fluoride on nine (9) locations. Alpha counts were made on samples from twelve (12) locations and beta counts on one (1) location, K-25 drinking water. Twenty-five (25) locations are sampled in all.

A tabulation of results, listing sampling locations, frequently of sampling and analysis results is presented in the Appendix of this report. The results this month as for all previous months, continue low, indicating that within the scope of this program, there is no significant problem of water contamination on the K-25 Area.

The S-50 sewer outfall indicated a continued decrease in uranium concentration, approaching the zero level, until the end of the month, when a result again up to 800 parts per billion appeared on a sample taken January 28. This result was possibly caused by thaws following the snowfalls of January 24 and 26 which may have washed into the river some of the remaining contamination from F-01.

The alpha and beta activity in the water continues to be less than one-thousandth of tolerance.

Consideration 1 is being given to revisions in the water survey program in the light of the negative results amassed at many sampling points: 13D, 2hD, 12W, 16W, 17W, 22W, 20W, 5 M, 8 M, 9M, 18M, 19M, 25M, and 23M. On the other hand, it appears desirable to determine the sources of the low level contamination found at points 1W, 21W, 14W, 15W, 6W, 26M, and 27M, in an effort to reduce contamination of waters to an absolute minimum. Further consideration need to be given to such factors as technique to insure representative sampling, rate of flow at the sampling points, and the effects of uranium in water on silt, mud and regetation.

VII. SPECIAL PROBLEMS

Coordination of Radiation Survey Instruments

At the request of the United States Atomic Energy Commission, an inventory was taken of all radiation detection instruments. In addition, the requirements by operating group, for the first quarter of 1948, were estimated. Several meetings were held with the United States Atomic Energy Commission and with K-25 personnel for the purpose of reviewing procurement problems. Delivery dates and costs for instruments as furnished by the United States Atomic Energy Commission and K-25 Maintenance Shops were obtained. A purchase requisition was processed for the following instruments:

- 26 Victoreen 356 alpha survey meter
- 2 Hagh range gamma survey meter
- 2 L & W Electroscope
- 2 Cutie Pie
- 2 Portable quartz fiber electroscope
- 13 Victoreen 263 A beta-gamma survey meter

Letter to S. Visner from A. P. Dunlap, 1-19-48, "Water Sampling Program, K-25 Plant"



60 Pocket chamber personnel monitor 6 Charger for the pocket chamber

The matter of fabricating instruments, at the K-25 Plant, in addition to the 10 A.C. Poppies and 20 Zeutos under construction, was discussed and a specifi proposal for so doing will be forwarded to the Atomic Energy Commission.

Transportation of Radioactive Solution

A radioactive solution that was to be transported in a truck required shielding for the protection of personnel. It was determined that the radiation at one foot from a 30-gallon drum of solution would be about 2 roentgens/hr. unshielded. Calculations revealed that two inches (2") of lead would reduce the radiation intensity to safe levels. Further details are given in the letter of January 21, 1948, to Mr. A. A. Abbatiello.

Handling of Contaminated Equipment by Shipping Department

A survey was made of material handled by the Shipping Department for the purpose of determining the extent of radioactive contamination on such material. Data which had been collected for a period of one month are being analyzed. Only two (2) items were found which had a positive reading, and both were below health tolerance. The result of the survey will be discussed with interested parties.

Inspection of Radium Sources

A conference was held with representatives of the Laboratory to discuss problems in the handling and checking of radium sources, but no action was taken. It appears desirable that periodic checks be made on the physical condition of all radium sources. The incident involving a broken source reported under "Material Releases" has pointed out the need for such checks.

Decontamination of Process Equipment

The acid spray decontaminating chamber, located in K-1303, described in previous reports operated on an experimental basis during the month of January.

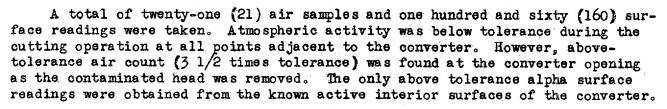
It was found that the dilute nitric acid -- cadmium nitrate spray -- solution removed light surface activity, but was ineffective in removing activity from any surface exposed to uranium materials under extreme temperature conditions or metal friction. Extended decontamination tended to destroy finish and working dimension.

New experiments are planned using other solutions in the spray chamber.

Hazards of Converter Disassembly Operation

A study was made of the Converter Head Removal operation on three Size One units. The problem was to determine whether any dangerous condition might exist while cutting open the head-end weld with a torch and during the removal of the contaminated head from the converter.





Masks were worn while the head was removed, and in the vicinity of the open converter end. Gloves were worn while handling the contaminated head. The study revealed that these safety precautions are adequate for the operation.

Instrument Development

Improvement of A.C. Poppy

Preliminary laboratory testing of the hand probe has been completed. The unit is being installed in a chassis placed in the field for additional tests. A small cylindrical probe has been designed and tested. This probe has a window at one end and a window on one side. The side window is covered by a protective screen and the end window is only covered with nylon.

The following values in counts per minute, were obtained in one of the test runs where the efficiency of the end section was compared with that of the side which is similar to the conventional Poppy probe.

	Background	End Window	Side (Nearest to end window)	Side (Center of Window)
Ž	1 8 2	233 245 250	271 305 295	332 327 338
	2 2 3	231 271	252 271	317 309
	Geiger voltage Operating Voltage Bias voltage	2200 2150 12		
P.S.	Probe collector wir Rubber hydrochlorid	00。 ه	05 [#]	

Manufacturing drawings are being made of improved surface probe.

Work was continued during the month on improving the circuit characteristics of the Poppy instrument. Curves were run and operating points of the various stages selected with a particular view to increasing sensitivity at low values of radiation and sharpening the amplified pulses so as to minimize the effect of coincidence counting. A comparative study is being begun on the instrument with and without a preamplifier so that a quantitative evaluation of the usefulness of such a stage is possible.



High Pressure Argon Ionization Chamber

The Chicago model has been adapted for continuous recording of gamma radiation of the order of background. The development of the instrument being substantially complete, a report is being written embodying the development experience, design characteristics, photographs, and diagrams of the unit as it is to be installed.

A work order has been reserved for sixteen (16) Argon Gammagraph installations in the Process Buildings. These units will replace the present RM-2 units.

Sampler for Air-Borner Alpha Emitters

The Instrument Department has been requested to standardize on a sampling unit for air-borne alpha emitters, giving consideration to the use of a flat disc filter sample, simplified operation, reduction in weight, and improved flow metering.

A filter Queen vacuum cleaner was obtained and adapted for testing. Pressure drop tests, at various flow rates, were made on five samples of filter paper. In addition, a special discharge nozzle was designed, fabricated, and tested for possible use in controlling and indicating air flow.

VIII. EDUCATIONAL PROGRAM

Maintenance Division

The lecture series being presented in this Division by the Radiation Hazards Department is continuing as outlined in last month's report.

The following table lists the lectures given this month in the Maintenance Division. It is anticipated that the remainder of the lectures, to cover the Maintenance Division personnel, will be given in the near future.

<u>Da te</u>	Type of Group	Type of Personnel	No, of Persons Present	Location of Lecture
1-6-48	Electronic & Pneumatic Inst.	Mechanics & Super- vision	16	K-1024
1-8-48	Electronic & Pneumatic Inst.	Mechanics & Super- vision	15	K-1054
1-8-48	Process Maint.	Mechanics & Super- vision	55	K-310-1
1-8-48	Process Maint.	Mechanics & Super- vision	43	K-310-1
1-13-48	Inst. Mechanics	Mechanics & Super- vision	11	K-102/4

SECRET

Date	Type of Group	Type of Personnel	No. of Persons Present	Location of Lecture
1-16-48	Mechanics and Sheet Metal Men	Mechanics	51	K-1401
1-16-48	Riggers and Carpenters	Mechanics	46	K-1401

Total for the month of January: Seven (7) lectures to 237 men.

Laboratory Division

Instruction was given to personnel of the Laboratory Division concerned with radiation monitoring. Five (5) sessions were held, with a total attendance of sixteen (16) persons.

The material covered included the reasons for contamination monitoring; the standard radiation data report forms and their use; and the usual instruments employed, their principle, calibration, and use, including individual practice with each instrument.

Process Division

The orientation of personnel in the Process Division with respect to Radiation Hazards and precautions is being carried out by supervision.



APPENDIX

Included in the Appendix is "Water Survey Program", consisting of four (4) pages.

Water Survey Program

to report of Health Physics Activities for January, 1948

Appendix (Part I)

January, 1948

Fluoride Conc. p.p.m.

Uranium Conc.

Date Sampled

Location

Plot Plan Ref. erence Number

p.p.b.

Activity Alpha Counts per min, per 100 ml,

per min. per Beta Counts 100 ml.

+1 C	+1	+	41	+1	+1 ~3	°° +1	0 +1 8	0 +1	, , ,	1+00	* + O	°0 +1	400	°0 +1	°0 +1	0 ++	\$ ÷ 0°	°°°	°°	°°	0.2 ± 0.6		+1	+1	\$ 6 \$ 41 \$ 9		+1	++ 0.00	+1
Less than 0.2	£0.	Less than 0.2	than	Less than 0.2	then	Less than 0.2	Less than 0.2	then	Less than 0.2	than	than	Less than 0.2	than	Less than 0.2	than	Less than 0.2	Less than 0.2	s than	s than	s then								9	9
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1 2. 48	1-5-48	0	1-7-48	0	1-9-48	8	1-13-48	1-14-48	က်		Ca -	. 0	,	1-22-48	20 10 10 10 10 10 10 10 10 10 10 10 10 10	-26	0	8	1	1-30-48	1-2-48	1-5-48	1-7-48	1-8-48	8	1-12-48	0	1-14-48	1-15-48
Clinch River, five	miles downstream of	last K-25 effluent				•															Effluent Water from	K-25 Water Purification	Plant						
13 D										-								-			24 D								

D1 - 2 - 12 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	•				Activity	Beta Counts
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		1-19-48	0		(C)	000
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		1-21-48	0		+1	ဝ ဝ ဝ
		1-22-48	0	2240	+1	00
		1-23-48	0		+1	0.0
		1-26-48	0		+1	800
		1-27-48	0		+1	က်
		1_28_48	0		+1	ဝွိစ
		1-29-48	0		+1	000
		1-30-48	0		+ 0	0.0
12 W	Clinch River Influent	1-5-48	O	Less than 0.2	7°0+ 1°0	
	to K=25	1-12-48	•	than	. C	
		1-19-48	0		‡ r	
		1-28-48	0	then	2°0 ± 0°2	
16 #	Drinking water,					
	Garage Area	1-8-48	0	Less than 0.2	900 + 600	
	K-131 Bldg.	1-12-48	•	Less than 0.2		
		1-23-48	0	Less than 0.2	+1	
	K-131	1-28-48	Ö	than	+1	
10 #	Clinch River immedi-	1 5 48	0	Less than 0.2	0°0	
	ately below S.50 Sewer	1-14-48	0	500	0.5 + 0.6	
	outfall	1-19-48	0	ď	+1	
		1=28=48	0	Less than 0.2	+1 	
21 W	S-50 Sewer outfall	1-5-48	0	es O	9	
		1-14-48	ଛ	4.0		
		1-19-48	4	Less than 0.2		ğ
		1-28-48	800	0°3	ecimico	
N TI	Sewage disposal plant	1-5-48	φ		. Adher	
	influent	1-12-48	N	COMM) (
			!]	9 -



			0 0 1			e .
Plot Plan Ref- erence Number	Location	Date Sampled	Uranium Conc. P.P.b.	Fluoride Conc.	Activity Alpha Counts per min. per 100 ml.	Beta Counts per min. per 100 ml.
		1-19-48	0			8
		1-29-48	0	•		
15 W	Sewage Disposal	1 5 48	0	Optico	8	9
	Plant Effluent	1-12-48	0	, AMO		
		1-19-48	0	8	c.c.	
		1-29-48	٥	0	8	0
X	K-131 Drainage into	1-8-48	න		000	•
	Poplar Greek	1-14-48	4		8	3
	4	1-19-48	130	g	* 8	9
÷		1-29-48	9			change
M II	Poplar Creek Influent	1-5-48	0	Less than 0.2	0.0 + 0.5	
	to K-25	1-12-48	0	0°8	+1	
		1-19-48	2	69	+1	Q.
		1-23-48	0		+•	CONC.
17 1	Recirculating Water K-27	1=5=48	0	•	0°2 + 0°8	Ŋ
	K-25	1-12-48	0		+1	8
	K-27	1-19-48	0		1,1 ± 0,6	
	K-27	1-28-48	•	0	41	
1 888	Poplar Greek immediate	1.5.48	C	Loss than 0.2	41 C	rather.
	ely before Junction	1-13-48	· •		0	
	with Clinch River	1-19-48	0	than	+1	CD CD
		1-29-48	0	than	0.5 ± 0.5	di con
₽	Poplar Creek Inlet ME	1-9-48	× **	Cara	0.0	
	of K=303=8	1-12-48	₩.	Caro	ņ	Ą
		1-19-48	- - -	CT.CD	Q TO	
		1~28~48	63	8	ĝ	
20 W	Cafeteria Cooking Water	1-8-48	0	Less than 0.2	1.6 ± 0.7	
		1-13-48	0	then	+1	
•		1-23-48	O (0°414	
		1= 25= 48	5	Less than Joz	-1	green .

Plot Plan Ref.	Location	Date Sampled	Uranium Conc. p.p.b.	Fluoride Cono. p.p.m.	Alpha Gounts per min. per 100 ml.	Beta Counts per min. per 100 ml.
X 2	Drainage from Pond SW of Garage Area into Poplar Creek	1=13-48	0	.)		8
n H	Drainage from Process Bldgs, into Poplar Greek North of K.303.8	1.5-48	0			ð
4 M	Drainage from Process Bldgs into Poplar Greek opposite K.305.2	1-19-48	0	e g		G
S	Drainage from Process Bldgs, into Poplar Greek opposite K=306-4	1-19-48	O	99		en e
M 8	Drainage from Hot Sorap Yard into bay MW of Gall- aher Gate	1_20_48	0	9	4.00	ace.
M 6	Clinch River West of Jones Scrap Yard	1-20-48	0	The second secon	5798	di-
18 M	Powerhouse Water Disa	1-19-48	0	Ç.	9	control of
N 61	Powerhouse Water Intake	1-19-48	0		9	
23 K	Ground Water Adjacent to K-1239 Sludge Pit	1-19-48	0		contract of the contract of th	Case
25 M	Clinch River above Elza Gate	1-16-48	0	Less than 0.2	0.8 + 0.6	
26 & 27 M	Drainage from all Laboratories	l=29=48	63	\$	0.4 + 0.5	COOR

WCX-894 (Jan'48)

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Report Number: K 178 Part II

RHG-20,483

CARBIDE AND CARBON CHEMICALS CORPORATION K-25 PLANT OAK RIDGE, TENNESSEE

REPORT OF HEALTH PHYSICS ACTIVITIES FOR FEBRUARY, 1948

Compiled by S. Visner

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Report Number <u>K 178 Part II</u>

Date of Issue <u>March 23, 1948</u>

Title: Report of Health Physics

Activities at K-25 Plant

for February, 1948.

Author: S. Visner

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CARBIDE AND CARBON CHEMICALS CORPORATION

K-25 Plant

Oak Ridge, Tennessee

SUMMARY

The Health Physics Activities in the K-25 Plant for February, 1943 are reported. The results of radiation surveys, area and personnel monitoring, air sampling, and water survey program are presented. A summary is given of development work on instrumentation for radiation monitoring and also special problems involving the control of radiation hazards.

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UNGLASSIFIED



THE REAL PROPERTY.

I. INTRODUCTION

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The scope of the Health Physics survey program has continued to increase with respect to number of locations and operations surveyed and also with respect to formal reporting of the data. In particular, a Laboratory Survey Group has been organized in the Laboratory Division and appropriate divisional Standard Practice Procedures have been issued.

The tolerance levels for radiation and radioactive contamination remain as listed in the report for December, 1947.

The primary problem continues to be the prevention of the ingestion of alpha emitters. A program of locating and eliminating radioactive contamination throughout the plant was continued. It is anticipated that the installations of stainless steel surfaces and changes in equipment and operation will prove of value in the control of contamination. Extensive use is made of protective clothing and equipment to minimize exposure of personnel.

In order to determine the procedure and precautions necessary for protection of personnel during large scale maintenance operations on the cascade, all phases of a complete cell converter change were carefully monitored. The degree of surface, air, clothing, and hand contamination proved to be low.

The educational program was continued which included lectures on radioactivity hazards and precautions and the operation of radiation survey instruments.

The fabrication of an initial batch of A. C. Poppy alpha counters was completed by plant facilities and the instruments distributed to operating groups. A compact, lightweight air sampling unit was developed which utilizes a flat filter disc of standard dimension. One unit was completed and underwent field tests.







II. ORGANIZATION

The plant organization with respect to administering the policies pertaining to the protection of personnel from potential radiation hazards remains essentially unaltered. The responsibilities and duties of the various groups concerned with the problems are listed in the report for October, 1947. The monitoring of radiation is performed both by the operating groups and the Health Physics Section of the Radiation Hazards Department as part of its audit responsibility.

III. RADIATION SURVEYS

Routine surveys were conducted in the plant during the month of January by the operating groups. All locations with above tolerance contamination found on these surveys are usually decontaminated. The locations for which surveys are formally reported and their frequency are as follows:

LOCATION	ALPHA SURFACES	BETA GAMMA	AIR SAMPLES
K-25 and K-27 Process Line Recorder Stations	Weekly		As required
K-101 C-816 Stripping Building	Monthly		As required
K-131 Feed Room	Twice Monthly	Daily	As required
K-631 Tails Withdrawal	Twice Weekly	Daily	As required
K-300 R. R. Area	Weekly	-	As required
K-300 Maintenance Shops	Monthly		As required
K-300 Maintenance Operations	All Jobs		All jobs
K-302-5 Cold Trap Room and Purge and Product Room	Monthly		As required
K-306-7 S. S. Area	Twice Weekly		Daily
K-1004 Laboratory B Room 101 - Analysis Laboratory Room 104 - Gravimetric Lab. Room 105 - Analysis Laboratory Room 108 - Plating Laboratory Room 111 - Balance Room	Twice Weekly Twice Weekly Twice Weekly Twice Weekly Twice Weekly	On request On request On request On request On request	Monthly



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Inantion	Tala Prince	D0 02	WIT.
<u>Location</u>	Surfaces	<u>Gamma</u>	<u>Samples</u>
K-1004 Laboratory B (Continued)			
Room 114 Counting Room	Twice Weekly	On request	Monthly
Room 115 Fission Counter Henry	Twice Weekly	On request	Monthly
Room 116 Fission Counter Herman	Once Weekly	On request	Monthly
Room 119 Office	Once Weekly	On request	Monthly
Room 121 Office	Once Weekly	On request	Monthly
Room 122 Special Analyses	Twice Weekly	On request	Once Weekly
K-1004 Laboratory C Mass Spectrometer Section (4 rooms)	Once Weekly	On request	On request
K-1004 Laboratory D Research (5 rooms)	Once Weekly	On request	On request
K-1301 Conversion Room	Twice Weekly	Weekly	As required
K-1303 Decontamination Room	Twice Weekly	Weekly	As required
K-1401 Barrier Research	Once Weekly	On request	On request
K-1401 Vacuum Pump Shop	Daily	• • • • • • • • • • • • • • • • • • •	As required
K-1401 Seal Shop	Daily		As required
K-1401 A.C. Pump Shop	Daily		As required
K-1401 Valve Shop	Weekly	∞ ⇔ ⇔	As required

In accordance with its responsibility, the Health Physics Section conducted spot surveys on an irregular schedule.

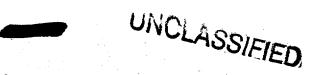
The results of routine surveys made or authorized by the operating groups and the results of spot checks made by the Health Physics Section are summarized for each location involved:

K-101 -- C-816 Stripping Building

Routine Surveys (Operating Group):

One (1) survey was made this month. A contaminated scale was found with readings





as high as 5000 c/m, resulting from a recent material release reported in the previous monthly report. This activity was subsequently decontaminated.

Spot Surveys (Radiation Hazards Department):

One (1) survey was conducted with only one small area found above tolerance. The end of the withdrawal line indicated 5332 c/m with 1009 c/m transferable. Operators wear gloves and masks while sampling and handling cylinders, and some count on the end of the withdrawal line is anticipated. The procedures appear adequate.

K-131 Feed Purification Building

Routine Surveys (Operating Group):

Two (2) alpha surveys were made in which readings were found as high as 3525 c/m on floor and 2783 c/m found on cylinder wrench. All beta-gamma readings were below tolerance.

Spot Surveys (Radiation Hazards Department):

Four (4) spot surveys were made during the month of February, revealing several spots above tolerance. The majority of above tolerance locations were in the vicinity of the steam baths with readings as high as 4228 c/m found on top of "D" bath. This is primarily due to the operation of changing cylinders daily. All air and beta-gamma readings were below tolerance. Operators wear gloves, masks, and coveralls while changing cylinders. The area is decontaminated frequently to maintain safe conditions. Provisions are being made to set up personnel monitoring and visitor control.

K-631-- Waste Disposal Building

Routine Surveys (Cperating Group):

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Eleven (11) routine surveys were made with readings as high as 3684 c/m found on scales. The maximum floor reading was 7938 c/m. Approximately 19000 c/m was



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found on a vent pipe, caused by the Material Release reported in the previous monthly report. This is discussed in more detail under "Special Problems".

Spot Surveys (Radiation Hazards Department):

Two (2) spot surveys were made during this month, which confirmed the readings taken by Operating Group. The survey made on February 24 revealed that these spots had been cleaned up. Coveralls, gloves and mask are worn when sampling and changing cylinders. Provisions are also being made to set up personnel monitoring and visitor control. (See Special Problems section).

K-300 -- Coded Chemicals Vaults

<u>Vault 17A</u> -- Contaminated Carbon and Alumina Handling

<u>Spot Surveys</u> (Radiation Hazards Department):

Two (2) surveys were conducted during the month of February. The surveys revealed above tolerance contamination of 3130 alpha c/m on the floor around the contaminated carbon sampler with possible transfer of 626 alpha c/m. Alpha activity of 2504 alpha c/m was found on floor outside the vault fence in K-305-2 basement. It was possible to transfer 626 alpha c/m of this material.

Atmospheric air samples were run during contaminated carbon sampling operations. Above tolerance alpha air counts as high as 192.41 alpha counts/ft³/min. was found in the vault. An alpha surface reading of 11524 alpha c/m was taken on the floor at the carbon sampler with possible transfer of 8,643 alpha c/m. Approximately 3300 alpha c/m was found on operator's gloves. A hand count revealed that the operators hands were below tolerance.

Operators wear mask, gloves and coveralls during carbon sampling operations. Shoe protection has been instituted.

Because the intakes to the building air circulation system is near the vault, a survey was conducted of the K-305-1 and K-305-2 cell floor ventilating system to determine if contaminated carbon was getting in the ventilating system, Wipe

tests from inside the vent ducts in K-305-1 and K-305-2 revealed contamination as high as 820 alpha c/m, indicating that contamination was being spread by the blowers. The carbon sampler will be moved out of vault 17A to a more isolated location in order to remove this source of contamination. Above tolerance locations are decontaminated.

Vault 16-A -- Contaminated Solution Handling

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were conducted during the month of February. One survey revealed a high level of alpha surface activity including a reading of 24506 alpha c/m on the floor with possible transfer of 1565 alpha c/m. Operators gloves were contaminated up to 3065 alpha c/m. A check on operators shoes revealed a reading of 939 alpha c/m.

Protective equipment, in the form of coveralls and gloves is used when handling drums of contaminated solution, and gloves, coveralls, and mask when sampling and transferring solution in containers. Shoe protection has been instituted.

A hand counting program will be put into effect. It is planned to relocate the storage and sampling of contaminated solutions.

K-303 Buildings -- Flant III

R. R. Area, Cell Floor

Routine Surveys (Operating Group):

Two (2) surveys were made this month which revealed alpha contamination as high as 36000 c/m on the platform of cell 10, K-312-3 with a wipe count of 1800 c/m. This location will be decontaminated.

Spot Surveys (Radiation Hazards Department):

Three (3) spot surveys were conducted during February. A survey found several contaminated spots on the floor of old Cascade Service store room in K-304-5. Up to 576 c/m of this material could be transferred. This location is being decontaminated, and worked upon to reduce the activity. The room is kept closed. Surveys also revealed



a contaminated section of the floor of approximately 10 sq. ft. between cells 10 and 12, K-312-3 with a maximum reading of 8200 c/m, and also a high wipe count of 820 c/m on the vent duct of cell 1 - K-305-2. The above contamination has been cleaned up.

Equipment Portal to Plant III -- K-306-1

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were conducted during the month. The only contaminated item found was a decontamination bucket with 8000 c/m. All other readings were below tolerance.

K-300 and K-400 Areas -- Process Instruments Shops

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were made this month in each of the following process instrument shops: K-301-4, K-303-7, K-305-9, K-305-10, K-402-9. In the K-305-9 shop, only one small area with an activity of 14,400 alpha c/m was located on the floor, and this was promptly decontaminated.

K-300 and K-400 Areas -- Process Maintenance Shops

K-312-2 Maintenance Shop, Valley Iron Pump

Routine Surveys (Operating Group):

Two (2) surveys this month located surface alpha activity up to 3600 c/m in several work locations in this shop. Subsequent decontamination reduced the activity to a below tolerance level.

Spot Surveys (Radiation Hazards Department):

Four (4) surveys of this shop during the month agreed closely with the results of the routine surveys. The periodic surveys made of this shop should help keep the contamination below tolerance, as it was at the end of this month.

K-300 -- Process Area Maintenance Jobs

A.C. Pump Work-Vacuum Pump Repairs, and Seal Changes.

A total of ten (10) maintenance jobs surveys throughout the cascade gave results which confirmed those reported in the previous monthly report, namely; that parts removed, tools, gloves used, and area around job, were frequently highly contaminated. Air counts are usually above tolerance.

Masks, gloves, and coveralls are required during such maintenance jobs which call for opening equipment which was in the process stream. The existing specifications of safety equipment appear adequate at this time. (See Hand Count Section).

K-302-1 through K-303-10

Routine Surveys (Operating Group):

Three (3) surveys were made this month. A high count of 2330 c/m was found on stair well wall on cell floor, K-302-5, with no detectable transferable material.

Spot Surveys (Radiation Hazards Department):

One (1) survey of the operating floor made during February revealed four (4) spots above tolerance, the highest being 2060 c/m with no detectable transferable material. Activity was found on the floor of the K-303-9 Line Recorder Station in about one square foot areas. In a survey of a cold trap in K-302-5, above tolerance alpha activity was found, highest surface count being 8806 c/m, with a 2203 c/m wipe test inside the heater box, which is inaccessible to personnel. A re-survey made one week later, after one attempt at decontamination, defined the highest activity level as 3391 c/m with no transferable material. Continued effort is made to eliminate all above tolerance contamination.

K-311-1 through K-301-5

Routine Surveys (Operating Group):

Four (4) surveys were made during the month of February. A maximum reading of 1115 alpha c/m was found on the K-311-1 nitrogen purge headers with no transferable activity.

Spot Surveys (Radiation Hazards Department):

One (1) survey of this area revealed only four (4) small areas above tolerance with the highest reading being 3708 surface c/m with possible transfer of 412 c/m. The contamination was found in the vicinity of manifold pumps in Line Recorder Stations in K-301-1, K-309-3, K-310-1, each covering an area of about 1 square foot. Three (3) cylinders were found with above tolerance in the old Feed Room on the cell floor in K-309-1. The highest activity level was 11,360 c/m with no dectable transferable material. This material will be decontaminated. It is anticipated that other isolated contamination resulting from past operation will be found and removed.

K-302-5 Purge and Product Room

Spot Surveys (Radiation Hazards Department):

In a survey made of the purge and product room in K-302-5, only one spot above tolerance was found, on the pit wall, with a wipe test of 5219 c/m. This is being decontaminated.

K-304-1 through K-305-11

Routine Surveys (Operating Group):

Ten (10) surveys were made during the month of February. Activity found was 36,140 c/m in the old cascade service office in K-304-5 cell floor. (See discussion under R.R. Area-Cell Floor).

Spot Surveys (Radiation Hazards Department):

A number of above tolerance locations were found on one survey this month. The highest count was 9648 c/m, with no transferable material. All readings were found on floors around Line Recorder Stations in K-305-10, K-305-6, K-305-3. The practice followed is to promptly decontaminate all such spots. This area is now being regularly surveyed by the Operating Group.

K-303-8, 9 and 10 Equipment Storage Areas -- Cascade Services.

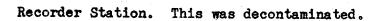
Spot Surveys (Radiation Hazards Department):

One survey conducted at this location revealed only three above tolerance readings. A high reading of 6483 alpha c/m was found on one small valve in storage at K-303-10.

K-305-12 through K-312-3 -- Process Operating Floor

Routine Surveys (Operating Group):

Four (4) surveys were conducted during the month of February. A maximum reading of 6660 c/m was found on the floor around a vacuum pump in K-306-1 Line



Spot Surveys (Radiation Hazards Department):

Three (3) spot surveys confirmed the results of the routine survey. This activity which can probably be attributed to past spills was removed.

K-306-7 S.S. Area

Routine Surveys (Operating Group):

Eight (8) surveys were made during the month of February revealing alpha contamination as high as 4978 c/m on "B" stand, position #3, of which 3144 c/m could be transferred. Air samples were taken daily, with no above tolerance results reported. (See Hand Count Section).

Spot Surveys (Radiation Hazards Department):

Three (3) spot surveys were conducted during the month. Activity was found as high as 4034 c/m on the defrosting unit with 1860 c/m of this activity transferable. All above tolerance readings are followed by decontamination. The product withdrawal room operators use gloves when withdrawing product. A stainless steel floor has been installed in the Product Withdrawal Room to simplify decontamination

K-312- Basement -- R.R. Area

Routine Surveys (Operating Group):

Three (3) surveys were conducted during the month of February. The maximum reading was 66620 c/m on the Valley Iron Works pumps #1 and 2 in cell 9, K-312-1. The same amount of activity was transferable.

Spot Surveys (Radiation Hazards Department):

Four (4) spot surveys were conducted in February. Spot checks found readings beyond 66,000 alpha c/m on #1 and 2 Valley Iron Works pumps base Cell #7, K-312-1. There was also 66,000 c/m transferable from this source. Number 1 Valley Iron Works pump, Cell 13, K-312-1, had a surface count of 52500 c/m with wipe count

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of 10500 c/m. A total of six (6) atmospheric activity samples were taken around the Valley Iron Works sumps in K-312-1. with carbon seals. Only one above tolerance count was obtained, taken four feet from pump, #1, cell 13 - count of 6.82 counts/ft3/min. It appears that this material eminates from leaking carbon seals. All alpha activity on Valley Iron Works pumps has been decontaminated. Further study is planned to attempt to eliminate these occasional above tolerance air counts. (See Hand Count Section.)

K-402-1 through K-402-9

Routine Surveys (Operating Group) :

Three (3) surveys were made, in which readings as high as 1804 c/m were found on the wooden floor around the feed filter. This floor has since been replaced.

Spot Surveys (Radiation Hazards Department):

One (1) survey was made this month, which revealed only one spot above tolerance. This reading (1189 c/m) was found on the floor beneath the sample point at K-402-3 Line Recorder Station, and was probably caused by changing sample tubes. Operators wear gloves while sampling and spots are cleaned up after samples are taken.

K-1004 - A, B, C, and D Laboratories

Room 101-B - Analysis Laboratory

Routine Surveys (Operating Group):

Five (5) alpha surface surveys were made at this location. All readings were below tolerance with the exception of those taken on a work bench top where 850 c/m surface activity and 100 c/m wipe test activity was found. This surface was successfully decontaminated and two (2) later surveys showed no recurrence.

Spot Surveys (Radiation Hazards Department):

One (1) survey was made in this room showing no surface alpha activity.



Room 104-B -- Gravimetric Laboratory

Routine Surveys (Operating Group):

Six (6) alpha surveys indicated a fluctuating activity level. Hoods C and D showing up to 10,000 c/m surface activity and 115 c/m wipe test activity on the thirteenth, had by the following week, on the twentieth, been reduced to below 800 c/m surface activity and zero transferable activity. The top of a footstool, which had been below tolerance early in the month, reached 1350 c/m on the twenty-fifth, was successfully decontaminated Minor changes in procedures reduced air counts from 2.7 c/m/ft³ on the sixteenth to 1.18 on the eighteenth.

Spot Surveys (Radiation Hazards Department):

A spot check, made on February 24, showed all surfaces below tolerance save one, the top of a sample tube rack, which read 1075 c/m. A second spot survey on the twenty-seventh found this spot properly decontaminated.

Room 105-B -- Analysis Laboratory

Routine Surveys (Operating Group):

A routine survey early in the month showed counts up to 1275 per minute on storage shelves, 2050 c/m on work surfaces. This condition which still existed on the seventeenth, was successfully decontaminated by the twentieth, when a routine survey showed no above tolerance results, beyond one spot on the floor beneath Hood E, which read 3775 c/m. This point had not been decontaminated in two subsequent surveys. All other points maintained satisfactory activity levels.

Spot Surveys (Radiation Hazards Department):

This room was found to meet tolerance specifications with the exception of the spot under Hood E, discussed above, which was located in a spot check on the twenty-fourth. A point inside the Hood A, on the working surface, which showed activity up to 2020 c/m, no detectable transferable material, was also located by this spot check. A routine survey on the twenty seventh revealed that the decontamination of the location was effective.

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Room 108-B -- Plating Laboratory

Routine Surveys (Operating Group):

Several points on the floors and table tops reading 950 c/m on the seventeenth, checked well below tolerance on a survey made on the nineteenth. A total of four surveys in all, showed no other activity.

Spot Surveys (Radiation Hazards Department):

No activity, either surface bonded or transferable, was located by Health Physics spot checks conducted late in the month.

Room 111-B -- Balance Room

Routine Surveys (Operating Group):

Three (3) routine operating surveys made this month showed no appreciable alpha activity. The highest reading obtained was 400 c/m on a table top. All wipe tests were zero.

Room 114-B -- Counting Room

Routine Surveys (Operating Group):

Six (6) routine operating surveys taken during February showed no alpha activity, either surface or transferable, that exceeded the established tolerance values. One spot on the film table that gave a surface activity of 750 c/m and transferable activity of 42 c/m was effectively decontaminated.

Room 115-B -- Fission Counter Room

Routine Surveys (Operating Group):

Four (4) routine surveys of this location were made by Operating Personnel during February. All were negative.

Room 116-B -- Fission Counter Room

Routine Surveys (Operating Group):

Four (4) routine surveys in this room gave no indication of alpha activity. Both surface readings and wipe tests were taken.



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Spot Surveys (Radiation Hazards Department):

No detectable alpha activity was found by Health Physics Surveyors.

Room 119-B -- Counting Section Office

Routine Surveys (Operating Group):

Two (2) routine surveys were made in this room during February. No alpha activity above allowable levels was found.

Room 121-B -- Counting Section Office

Routine Surveys (Operating Group):

Two (2) surveys were conducted by divisional personnel. Desk tops, floors and equipment were checked. The only high reading was obtained on one chair where surface counts of non-transferable activity up to 750 c/m were found. This chair was later decontaminated. The second check, one week later, found no activity.

Room 122-B -- Special Analysis Laboratory

Routine Surveys (Operating Group):

Seven (7) surveys were conducted during the month, which included three sets of air samples. On surveys made on the tenth and thirteenth, activity up to 1150 surface counts per minute and 252 c/m wipe tests were found on surfaces of hoods and bench tops. Later surveys on the seventeenth, nineteenth and twenty-third showed these areas had been decontaminated to below tolerance values. A chair in regular use in the room was found to have non-transferable surface activity up to 1550 c/m. This was subsequently decontaminated. A reading of 2575 c/m surface activity and 1320 transferable activity on a sink apron appeared in a survey on February 25th and was decontaminated. The February 27th survey showed no activity above tolerance levels.

Spot Checks (Radiation Hazards Department):

Health Physics Surveyors found surface activity up to 1025 c/m around the sink apron and work bench on Feb. 25th. This survey also showed transferable activity up to 200 c/m at the same location. Readings up to 1650 c/m surface activity was found on the inside wal surfaces of Hoods B and C, and readings up to 16750 c/m on the top surface of an evaporator

bath. These locations were known to be regularly highly active, as some spattering during evaporation operations is inevitable. Operating personnel in the room wear laboratory aprons, rubber gloves and safety glasses when working directly at these evaporation baths, always place or remove evaporating dishes with special tongs used only for this operation. Routine decontaminations are carried out at least once a month, to prevent large accumulations of active materials.

Mass Spectrometer Section (Four Rooms)

Routine Surveys (Operating Group):

On the request of this group, a survey was conducted by the Laboratory Survey Group of a batch of used valves stored in a special storeroom. These were found to have surface and wipe test activities up to 1500 c/m, and were labeled accordingly. Arrangements are being made to have them decontaminated. Regular area surveys in the Mass Spectrometer section were not made by the Routine Survey Group, but by the operating Personnel, who did not make formal reports. The new procedures will, however, be adopted for March. From the information available on February surveys, it is evident that surface contamination on work surfaces and equipment is under control, all wipe test results being below tolerance and all above tolerance surface activity, none of which exceeded 1800 c/m, having been decontaminated. Several high spots on the floors, up to 2400 c/m, appearing since the general floor decontamination in January are apparently due to recent spills. To date these points have resisted regular decontamination methods, and special treatment has been scheduled. This activity is not transferable.

Spot Surveys (Radiation Hazards Department):

A Health Physics survey made on February 12th found no above tolerance activities in this section. Operating procedures are designed to minimize the contamination of work surfaces and equipment.



Research Section -- Laboratory D (Five rooms)

Routine Surveys (Operating Group):

A cutting wheel in Room 2 was found to have a surface activity up to 4500 c/m on its cutting surface. Wipe tests were low, but the nature of the wheel surface was such that wipe results might be somewhat inconclusive. The wheel has been used for cutting samples from bar stock of Uranium metal, and the cutting oil used in the machine is also contaminated. Arrangements were made with Coded Chemicals to dispose of the contaminated oil and cutting wheels. The machine is being decontaminated.

Spot Surveys (Radiation Hazards Department):

A Health Physics spot check showed that alpha activity was confined to the above areas. Beta-gamma activity was well below established tolerance values.

Barrier Research Laboratory - 1401

Routine Surveys (Operating Group):

A routine survey of this section was conducted on February 23rd. All locations checked indicated no radiation. Both alpha and beta-gamma searches were conducted.

K-1024 Instrument Building

Spot Surveys (Radiation Hazards Department):

Six (6) surveys of both the Electronic and Pneumatic sections of this building were conducted this month. Alpha surface readings and air counts were all below tolerance.



K-1031 - Contaminated Carbon and Equipment Storage

Spot Surveys (R.H.D.)

A survey conducted during February revealed above tolerance readings as high as 6618 alpha c/m on top of a process material cylinder with possible transfer of 1790 alpha c/m. A one square foot area on the floor had reading of 4412 alpha c/m with possible transfer of 179 alpha c/m. Personnel working in this building wear gloves while handling containers, and the work in this building is infrequent. The building is kept locked when not in use.

K-1301 -- C-216 Generation and Oxide Conversion Building

Routine Surveys (Operating Group):

Six (6) surveys were made during February with readings reported as high as 56440 c/m on top of "B" reactor. The Weighing Room, Grinding Room, and Oxide Conversion Room were all above tolerance, and safety procedures are in effect in these known contaminated locations. All beta gamma readings taken were below tolerance.

Spot Surveys (R.H.D.):

Three (3) spot surveys confirmed conditions found by the Operating Group. Operators wear full protective clothing in the form of respirator, gloves, coveralls and shoes while working in the Weighing Room, Grinding Room, and the Oxide Conversion Room. Hand counts are taken daily. Signs are posted specifying that proper protective equipment be worn. No smoking or eating is permitted in above tolerance locations. All air samples, taken where protective equipment is not required, were below tolerance. Although above tolerance locations do exist and are known in this building, the safeguards in use are adequate.

K-1303 Decontamination Building

Routine Surveys (Operating Group):

Seven (7) surveys were made by the Operating Group. Readings were found as high as 10491 c/m on the floor near D. tank.

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were made. Since this is known to be a contaminated area, protective equipment is worn by operating personnel such as coveralls, gloves, respirator, and shoes. A daily hand counting program is in effect. Signs are posted and proper protective clothing must be worn before entering area. No smoking or eating are permitted in this location.

All air samples taken were below tolerance, as were beta-gamma counts.

K-1401 -- Maintenance Building

1. Cleaning Area and Scrap Enclosure

Spot Surveys (Radiation Hazards Department):

No above tolerance activity was found on two surveys, with the exception of known contaminated safety equipment awaiting decontamination. No hazard exists in this location.

2. A.C. Pump and Seal Shop

Routine Surveys (Operating Group):

Daily alpha surface counts are taken of work surfaces in this shop.

No above tolerance readings were reported.

Spot Surveys (Radiation Hazards Department):

As noted in the previous monthly report, contaminated pump and seal parts are stored in one corner of this shop until an effective, nondestructive decontamination process can be developed. When it is necessary to handle these parts, safety equipment is worn. Four surveys indicated the work locations are clean, and that all previously noted isolated contaminated

spots have been decontaminated. The present procedures appear adequate to insure personnel safety. (See Hand Count Section.)

3. Valve Shop

Routine Surveys (Operating Group):

Weekly alpha surface surveys were started during the month of February. No above tolerance readings were reported.

Spot Surveys (Radiation Hazards Department):

Several valve parts were found tagged as contaminated. These valves had been returned from the decontamination area as decontaminated, but complete disassembly had revealed the need for complete decontamination of these valves by components. Such items are handled with adequate safety equipment. All shop work surfaces were found clean in four surveys.

4. Vacuum Pump Shop

Routine Surveys (Operating Group):

Daily alpha surface readings disclosed no above tolerance activity on tools or work surfaces. Above tolerance count was found on a number of pump parts.

Spot Surveys (Radiation Hazards Department):

Four (4) surveys were made during this month. Work surfaces were kept free of contamination throughout the month by covering some tables with paper, painting others, and disassembling contaminated pumps in one small area. Pump parts with known activity are handled with proper safety equipment. In view of the measures taken to locate, confine, and eliminate contamination in this shop, the hazards to personnel seem slight at this time (See Hand Count Section).



A part of the plan for a decontamination shop in the K-1401 Building includes a space for the disassembly of contaminated items in an enclosed area using all necessary protective equipment, and decontamination in that same enclosure to localize activity in the building. It is anticipated that such an installation is at least six months away.

Pilot Flant -- Engineering and Development Division

Spot Surveys (Radiation Hazards Department):

Only two (2) small slightly above tolerance spots were obtained on one spot survey made this month. Both readings were on the product cylinder mount, and, since gloves are worn while handling the cylinder on this mount, the existing condition is not deemed hazardous. Internally contaminated components are properly handled.

K-1405 -- Engineering Chemical Development Building

Spot Surveys (Radiation Hazards Department):

Four (4) spot surveys were made during February. Several locations showed above tolerance readings. The filter press and filter paper had readings as high as 48,000 c/m and the electric furnace oven revealed 48,000 c/m with 7389 c/m transferable. The highest floor reading was 2090 c/m. One pair of gloves revealed 12315 c/m. Protective elothing such as shoes, coveralls, and gloves are worn while performing hazardous duties (See Hand Count Section.)

K-1410 Carbon and Alumina Storage

Spot Surveys (Radiation Hazards Department):

Two (2) surveys were conducted during February. Above tolerance conditions as high as 1720 alpha c/m on waste water drain in floor under



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carbon and alumina separator were found of which 430 c/m was transferable. The operations in this location are occasional and intermittent. All beta gamma radiation was below tolerance. Air samples were below tolerance.

As reported in the last monthly report this contamination can be attributed to the equipment used for separating contaminated carbon and alumina.

IV. PERSONNEL MONITORING

Hand Counts

K-306-7 - Product Withdrawal Station

Hand, shoe, and clothing counts are taken daily. All visitors are monitored and alpha activity must be below tolerance before eating or leaving the area. No above tolerance hand counts were reported this month.

K-305-9 - Change House

A hand counter has been installed at this location to survey all personnel leaving the K-305-12 to K-312-3 Area. Although some hand counts were initially above tolerance, all counts were removed before eating or going home.

K-1004-A and B - Laboratories

The hand count program for the Laboratories remained essentially the same through the month of February. An average of fifty-five employees per day were checked twice each shift in the Counting and Analysis Sections of Laboratory B, while about fifteen employees in Laboratory A were checked twice per shift. The completion of additional instruments will assure the start of regular hand count programs in Laboratories C and D in the near future.

Only one (1) instance of above tolerance hand activity appeared this month, and it was brought down to a normal safe value by a single re-wash.

K-1300 Area - Change House

Hand counts are taken before lunch and at the end of the shift every day. No above tolerance hand counts were reported.

K-1401 - Maintenance Shop

Both the Vacuum Pump Shop and combined Seal and AC Pump Shop continue as the only locations in the K-1401 Building taking regular hand counts before lunch and at the end of the day. No above tolerance condition was reported this month.

Other locations will institute hand counts as instruments become available.

K-1405 - Chemical Engineering Development Building

A hand counting program was started this month. No above tolerance conditions were reported.

Process Maintenance Personnel

More than 75 maintenance men were thoroughly monitored after completing jobs on process equipment. The gloves used to handle such equipment as seals, vacuum pumps, and stage pumps were almost always contaminated, but only occasional hand counts were above tolerance, and a first wash removed this activity in every instance.

Film Badges

Program

An average of one hundred fifty-two (152) film badges per week were issued throughout K-25 during February, exclusive of special non-routine badge usage. This represented an increase of ten badges over the preceding month. Their use was divided between personnel monitoring and area monitoring as follows:

	Stationary	Personnel
Process Division	44	28
Laboratory Division	5	23
Instrument Development Section	- · .	4
Critical Mass Laboratory	4	14
Pilot Plant	5	2
Emergency Monitors	-	12
Radiation Hazards Department	-	5



Twenty film badges for special non-routine usage were issued in February.

In addition, four special Neutron films were used each week in stationary locations in the Works Laboratory and the Critical Mass Laboratory.

Results

Film badge reports show that no above tolerance badge exposure occurred during the month of February.

V. PROCESS MATERIAL RELEASES

K-306-7 - Product Withdrawal Room - February 2, 1948

A 15 second material release occurred when a product cylinder was removed from "A" stand. The release was caused by the cylinder head becoming too cold during withdrawal, causing C-616 to solidify at the cylinder connection. The release occurred under an exhaust hood; therefore, no one was sent to the Dispensary. The highest surface alpha count found was 6400 c/m. No air samples were taken. The spill was immediately decontaminated.

K-306-7 - Product Withdrawal Room - February 2, 1948

A 10 second material release occurred when a side plug was removed from the above mentioned product cylinder prior to connecting the cylinder to the "A" stand for flash back to the cascade. The release occurred inside the "A" stand dry box, with exhaust facilities, gloves were worn by the operator, therefore, no one was sent to the Dispensary. The highest surface alpha count found was 6800 c/m. No air samples were taken. The stand was immediately decontaminated to below tolerance level.

K-306-7 Product Withdrawal Room - February 10, 1948

A minor C-616 release of two second duration occurred when a side plug was removed from a filled product cylinder. Safety equipment was being worn, therefore no one was sent to the Dispensary.



K-306-7 S. S. Area - February 19, 1948

A faulty product cylinder flange gasket was responsible for a one minute duration material release in the S. S. Area. The highest surface alpha count found was 1560 c/m on the cylinder holder. The affected area was immediately decontaminated to below tolerance levels. Two operators reported to the Dispensary.

K-312-3 Inter-Plant Sample Manifold - February 8, 1948

A five minute duration material release occurred when a length of copper tubing connecting a monel trap to the sample manifold split. Highest surface alpha count found was 905 c/m. Two men were sent to the Dispensary.

K-131 Fresh Feed Room - February 3, 1948

A material release of approximately 5 minute duration occurred when a MD type feed cylinder valve ruptured during normal feed operations. An area of approximately 100 square feet was affected by the spill. The highest surface alpha count found was 2,000 c/m. An air sample taken was reported as 5.22 c/m/ft^3 . Decontamination was started immediately. Three men reported to the Dispensary.

K-131 - Fresh Feed Room - February 5, 1948

The rupturing of an evacuation-valve bellows in the "C" bath manifold was responsible for a 15 minute duration material release. The Fresh Feed Room atmosphere was dense with C-616 smoke. The highest air borne alpha count reported was 18.01 c/m/ft³. Decontamination was accomplished using a vacuum cleaner and tri-sodium phosphate solution. Three men were sent to the Dispensary.

K-631 - Shipping Room - February 4, 1948

During the operation of drawing oil from a Beach Russ vacuum pump, C-616 material was released from the contaminated oil. The highest air borne alpha count found was 117.0 c/m/ft^3 . One operator was sent to the Dispensary as a result of this release.



K-301-3 Line Recorder Station - February 17, 1948

A small material release occurred when a Hoke sample tube was removed from a sample manifold. One operator was sent to the Dispensary.

VI. WATER SURVEY PROGRAM

The water survey program was continued unchanged during February.

The locations sampled and results of analysis are presented in Table I in the Appendix to the report. All analysis for uranium, fluorine, alpha, and beta counts continue to indicate negligible contamination of the water on the K-25 Area.



VII. SPECIAL PROBLEMS

Safety Equipment Decontamination

The problem of determining the effectiveness of decontamination of safety equipment was studied this month.

The procedure of checking all safety equipment before re-issue was instituted, since approximately fifteen (15) items per week are found that were still above allowable activity level after cleaning. Occasional activity as high as 4500 c/m was found on rubber gloves.

All items which do not meet tolerance limits after cleaning are separated and stored in anticipation of the development of a more effective cleaning method.

K-631 Building Vent System.

A survey by the operating group disclosed that, as a result of the major spill, January 31, 1948, described in the previous monthly report, the exhaust ductwork was contaminated up through the exhaust fans, three floors above the room in which the spill occurred.

All contaminated exhaust ducts were removed, decontaminated, and sprayed over with paint. The ductwork and fans were then reinstalled.

Personnel handling this equipment were adequately protected with safety equipment.

Converter Change Contamination Problem

Anticipating large scale replacement of converters in the cascade, the Process Division took advantage of the converter and valve seat change operation in K-302-4 cell 4 to determine the precautions necessary for such work in order to minimize personnel exposure to radioactive material. Since the operation involved torch cutting of converter



flanges, grinding process pipe, re-welding flanges, and disassembling process walves to replace the seats, elaborate precautions and controls were instituted.

The cell enclosures were well ventilated by means of large exhaust blowers. The alleyways adjacent to the cell were roped off and all persons entering the area were required to wear rubbers, gloves, coveralls, a gas mask, and hat. Hand and shoe counts were taken on all persons each time they left the area.

Air counts were taken during all operations, and surface counts taken near all open equipment.

When the job was half completed, results of air samples had returned in sufficient quantity to give an indicative result. Not one of 37 air samples taken throughout the entire job was above tolerance. The only surface counts above tolerance were those taken of inside surfaces of process equipment, (which was plugged as soon as opened) and on the floor where spool pieces were dropped. The maximum surface count obtained was 10,000 c/m. from the floor. The floor was subsequently decontaminated.

Consequently, masks were required only when opening process lines and gloves required when handling process piping. Hand counts were continued, but no above tolerance results were recorded.

If results obtained on this cell change operation are confirmed by further checks it may be permitted to relax requirements on use of protective equipment on such jobs.



Alpha Activity of Cascade Enriched Uranium

Calculations (1) were made to determine the alpha activity of process gas at various points of the cascade. For a concentration of loppm of process gas in nitrogen, the following counts, corrected for geometry, by a factor of one third, would be found:

Location	Alpha/min/ft3	Times Air Tolerance
K-306-7	139,300	69,650
K-303-10	8,600	4,300
K-302-5	3,400	1,700
Feed Unit	1,400	700

These results which are directly proportional to the concentration of UF₆ in nitrogen, also depend on the enrichment at each of these points, which varies slightly from month to month.

Safe Containers for Radioactive Solutions

Calculations were made to determine the amount and kind of shielding required for handling solution received from the Hanford Area. (2)

Fairchild Problem on Radioactive Gases

A problem in the disposal of radioactive gases encountered by Fairchild Engine and Aircraft Corporation considered. A letter was sent to Mr. R. W. Ulm of the Safety and Inspection Division. A minimum height of ventilating stack was recommended which would be adequate to assure the dispersal of these gases without endangering the health of nearby personnel. (3)

Memo to S. Visner, February 25, 1948 from N. Gerber. "Alpha Counts Around the Cascade"
 Memo to D. H. Stewart, February 25, 1948, from N. Gerber and S. Visner, "Safe Containe for Radioactive Solutions".

⁽³⁾ Memo to R. W. Ulm from N. Gerber and S. Visner, February 5, 1948.



Instrument Development

Special Probes for Alpha Survey Equipment

A long, narrow probe to be used with the Zeuto Meter was designed and constructed. The results of tests indicate that shielding and mounting of elements in the probe must be improved to reduce meter instability caused by movement of the probe.

A hand counter for the monitoring of the palms and backs of both hands in one operation is being assembled. It is planned to use two meters with this counter.

A comparative study was made of nylon and the rubber hydrochloride window materials. A report is being written containing the data obtained.

Improvement of A.C. Poppy

Tests were run on a pre-amplifier combined with a degeneratively coupled main amplifier. This Roppy circuit gave the highest signal to noise ratio of any circuit tried so far. Comparative tests are being run between the Model A and B poppy to determine quantitatively the improvement in background count caused by reduction of high voltage leakage.

Sampling Unit for Air-Borne Alpha Emitters

A small portable air blower was obtained and adapted for taking samples of air-borne alpha emitters. The design of the filter holder was changed from cylindrical to a flat disc type so that the standard 9 cm diameter filter paper could be used. The 9 cm paper can be counted by standard, laboratory counting equipment. For varying the air flow, a small butterfly valve was installed in the suction line of the blower. A fixed orifice and pressure indicator, calibrated in CFM, was installed on the discharge of the blower for air flow measurement. This design reduced the weight of the air sampler to approximately 11 pounds,



as compared to 22 lbs. for the Filter Queen.

The sampler is now undergoing field tests.

VIII. EDUCATIONAL PROGRAM

Maintenance Division

The lecture series being presented in this Division is continuing as previously outlined.

The following table lists the lectures given this month in the Maintenance Division:

Date	Gr	oup	Personnel	No. of Persons Present	Location of Lecture
	******	- X			
2-3-48	Maint.	Mechanics	Welders and Pipefitters	39	K-1401
2-3-48	T r _e	n	Welders, pipefitters insulators	50	K-1401
2-6-48	Plant 1	Engineering	Engineering Supervisors	15	K-1034
2-9-48	u	tt:	Elect.&Mech. Designers	25	K-1034
2-9-48	n-	n	Field Engineers	16	K-1034
2-23-48	16. ₁ .	ttr 1	Field Engineers and Designers	30	K-1034

Total for the month of February: Six (6) lectures to 175 men.

Appendix (Part 1) to Report of Health Physics Activities for February, 1948

A PPE ND IX

TABLE I

Water Survey Program February, 1948

					Activity	Beta Counts
Plot Plan Ref- erence Number	Location	Date Sampled	Uranium Conc. p.p.b.	Fluoride Conc.	Alpha Counts per min. per 100 ml.	per min. pe
13 D	Clinch River. five	2-2-78		Less than 0.2	0.0 ± 0.5	
	miles downstream of	87-2-7	0	than	+1	1
	last K-25 effluent	87-7-2	0		0.0 ± 0.5	•
		2-5-48	0	0.3	0.5 ± 0.5	•
		2-6-48	0	Less than 0.2	5 + 0.	•
		2-6-78	0	Less than 0.2	.3 ± 0.	
		2-10-48	0	8	0.7 ± 0.6	•
		2-11-78	0	. 1	0.5 ± 0.6	•
-			0	•	0.7 ± 0.6	•
			0		.1 ± 0.	•
		2-16-48	0	1,	0.2 ± 0.5	•
		2-17-48	0		1 ± 0.	•
		2-18-48	0	•	0.2 ± 0.5	•
		2-19-48	0	0.5	0 ± 0.	•
		2-20-78	0		2 + 0.	• .
		2-23-48	0	Less than 0.2	0.1 ± 0.5	•
		2-57-78	0		0.4 ± 0.5	•
		2-25-48	0	•	0.2 ± 0.5	1
		2-56-48	0		0.3 ± 0.5	•
		2-27-48	0	Less than 0.2	0.3 ± 0.5	•
24 D	Effluent Water from	2-2-48	0	ı	0.0 ± 0.5	7.0
	K-25 Water Purifica-	2-3-48	0		0.0 ± 0.5	0.0
	tion Plant	2-4-48	0	1	0.3 + 0.5	0 8 8
	,	2-5-48	0	1	.0 + 0.	ु 9• 0
		2-6-48	0	ŧ	5 + 0.	0.0
		2-6-78	0	ı	1 + 0.	1.4
		2-10-48	0	•	0.0 + 0.5	_•
		2-11-78	0		°0 + 9°	బ ి
		2-12-48	0	* •	0.2 ± 0.5	1.0

Plot Plan Ref- erence Number	Location	Date Sampled	Uranium Conc.	Fluoride Conc.	Activity Alpha Counts per min. per 100 ml.	Reta Counts per min. per 100 ml.
		2-13-48	0 (ı	+1	0.5
		2-17-48	00		14 H	• o
		2-18-48	0 (•	0.0 4.0 7.0	0.0
		2-19-48	5 C	B 1	- 1 +	0.0
		2-23-48	0	1 1	0.1 + 0.5	000
		2-24-48	0	· 1	+1	0.0
		2-25-48 2-26-18	O C	8 1	0.1 ± 0.5	0.0
		2-27-48	00	1 1	± +1	00
12W	Clinch River influent	2-2-78	0	Less than 0.2	0.1 ± 0.5	•
	to K-25	87-6-2	0	•	41	
		2-16-48	0	•	•	
		2-23-48	0	Less than 0.2	0.0 ± 0.5	
16W	Drinking water,	2-5-48	0	Less than 0.2	0.3 ± 0.5	
	Garage Area	¥	0	Less than 0.2	0.0 ± 0.5	
-	K-131 Bldg.	2-16-48	0	than 0	0 +	
	K-1050 K-131	2-23-48	0	Less than 0.2	0.1 ± 0.5	
low	Clinch River immedi-	2-3-48	r	Less than 0.2	9.0 ± 6.0	
	ately below S-50	2-6-78	0			,
	Sewer outfall	2-16-48	0	•	+1	
		2-23-48	0	Less than 0.2	0.0 ± 0.5	
21W	S-50 Sewer outfall	2-3-48	80	0.3	•	
		2-6-78	10	•	•	
		2-16-48	 2		•	
		2-23-48	ત્ય	Less than 0.2	•	
14%	Sewage disposal plant	2-2-48	0			
	influent	2-6-78	0	•	•	

Plot Plan Ref- erence Number	Location	Date Sampled	Uranium Conc. p.p.b.	Fluoride Conc. p.p.m.	Activity Alpha Counts per min. per 100 ml.	Beta Counts per min. per 100 ml.
		2-23-48	N O	1 1	1 1	1 t
မို့ ဦ	Sewage Disposal Plant Effluent	2-2-48 2-48 2-17-48 2-23-48	0000	1 1 1 1	E 1 1 1	1 1 1 1
ન હ	K-131 Drainage into Poplar Greek	2-3-48 2-13-48 2-19-48 2-23-48	16 0 0	1111	1/1 + 1	1111
ಹ ∎	Poplar Creek Influent to K-25	2-2-48 2-9-48 2-16-48 2-23-48	0000	Less than 0.2	0.0 ± 0.5 0.1 ± 0.5 0.2 ± 0.5 0.5	1111
S.	Recirculating Water K-27 K-25 K-27 K-27	2-2-48 2-9-48 2-16-48 2-23-48	0000	1 8 1 1	0.0 0.1 + 1+ 0.2 + 1+ 0.5 0.2 + 1+ 0.5	1111
व्य ६ ०	Poplar Creek immediately before junction with Clinch River	2-2-48 2-9-48 2-16-48 2-23-48	0000	Less than 0.2	0.1 + 0.5 0.5 + 0.5 0.3 + 0.5 0.2 + 0.5	1 1 1 1
ert a	Poplar Creek Inlet NE of K-303-8	2-2-48 2-9-48 2-16-48 2-23-48	2001	1111	1 1 1	1111
ň	Cafeteria Cooking Water	2-2-48 2-9-48 2-20-48 2-23-48	0000	Less than 0.2 Less than 0.2 Less than 0.2 Less than 0.2	0°0 0°0 0°0 0°0 0°0 0°0 0°0 0°0 0°0 0°0	



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minute were found on gloves. A program for changing gloves weekly and regulations governing smoking and eating are in effect. Although smoking and eating are prohibited around the steam feed baths, it has been permissible for operators to eat and smoke at the crew leaders desk which is located approximately 30 feet from the first steam bath. Protective equipment in the form of coveralls and gloves is used.

K-631 Waste Disposal Room

Routine Surveys - (Operating Group):

Three (3) reported surveys were conducted in this locale. Only three small areas were above tolerance with a maximum reading of 1900 counts per minute found on the floor near the west wall.

Spot Surveys - (Radiation Hazards Department):

Three (3) surveys were conducted during the month. On each survey, above tolerance readings were found on a one ft² area on the floor beneath the sampling point. Samples taken daily are responsible for this small contamination. Operators are protected during connecting and disconnecting operations with coveralls, gloves and gas masks. Smoking and eating are prohibited in the vicinity of the waste and sample withdrawal points. Except for this isolated area, the room as a whole can be considered a clean location.

K-300 Coded Chemicals Vaults

Vault IX

Spot Surveys - (Radiation Hazards Department).

A survey in Vault IX conducted on March 18th revealed above tolerance readings as high as 50,000 alpha c/m on product cylinders and cylinder tops in storage which were not designated as contaminated. Subsequent handling by uninformed personnel may constitute a hazard. Supervision has been notified of this condition and decontamination of the cylinders and cylinder tops will follow.

Vault 8A

Spot Surveys - (Radiation Hazards Department):

A survey conducted in Vault 8A revealed above tolerance readings within a safe formerly used for storage of product cylinders and on a scale located inside an office. The material on both the safe and the scales was transferrable. Gloves are worn by operators when handling product cylinders and samples.





Vault 15A

Spot Surveys - (Radiation Hazards Department):

A survey conducted in Vault 15A revealed one (1) above tolerance Occupancy Control reading on the floor. The storing of contaminated carbon in this area has been started recently.

Vault 16A

Spot Surveys - (Radiation Hazards Department):

A survey conducted on March 9th revealed above tolerance area as high as 66,000 alpha counts per minute on the floor. It was possible to transfer the material by wipe test. The above tolerance spots have resulted from the operations of sampling and transferring contaminated solutions. Above tolerance readings were found on operators' shoes.

Protective equipment in the form of coveralls and gloves are worn during operations in this area. A thorough decontamination of this vault was started this month. Design prints are in the hands of supervision for approval of a room to be built in this vault which will serve to localize sampling and transfer operations in a limited area. This room will be provided with surfaces which can be easily decontaminated.

Vault 17A

Spot Surveys - (Radiation Hazards Department):

Two (2) surveys were conducted in Vault 17A where a contaminated carbon sampler was formerly located. Above tolerance alpha emitting material is prevalent in the form of contaminated carbon dust in this vault. Decontamination of this vault was started in the latter part of this month. Contaminated carbon that had previously been drawn into the ventilating system of this building has been removed.

K-311-1 through K-301-5 Area Cascade Buildings and K-101 C-816

Stripping Building

Routine Surveys - (Operating Group):

A total of twelve (12) surveys were reported for the month. Only three (3) spots around block valves in pipe gallery of building K-301-5 were found above tolerance, highest being 7020 counts per minute. Four (4) surveys conducted in the C-816 Stripping Building revealed seven (7) above tolerance readings, highest being 8000 counts per minute found on a pipe at a sight glass.

Spot Surveys - (Radiation Hazards Department):

A survey conducted on March 25 revealed no above tolerance conditions on the operating floor. However, a high count of 12,000 counts per minute was noted on cylinders located in the former feed room in K-309-1 building cell floor. Supervision was notified and action has been taken to decon-



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taminate cylinders and to move them to proper storage.

In the C-816 Stripping Building one (1) survey revealed two spots above tolerance, namely 1824 counts per minute on a scale and 1140 counts per minute on a Welch pump. Operations in this building require that masks and gloves be worn when removing product and during sampling operations.

K-302-1 through K-303-10 Area III Cascade Buildings

Routine Surveys - (Operating Group):

A total of three (3) surveys were reported made during the month. Four (4) above tolerance counts were found, highest being 21,190 counts per minute found in purge and product room in the K-302-5 building.

Spot Surveys - (Radiation Hazards Department):

A survey conducted on March 15th revealed no above tolerance conditions on the operating floor. A high count of 10,000 c/m was found on the pit wall in the purge and product room covering an area of approximately 1 ft², 657 c/m of this material being transferrable. A count of 1350 c/m was found in a 1 ft² area on the floor by the #2 Beach Russ pump in the K-302-5 Cold Trap Room. None of this material was transferrable. In a one ft² area outside of the cold trap room an above tolerance reading of 6700 c/m was recorded. Supervision was notified and action taken to decontaminate areas above tolerance. With the exception of a few isolated spots as described above, this area is maintained relatively free of contamination.

K-304-1 through K-305-11 Area IV Cascade Buildings

Routine Surveys - (Operating Group):

Eight reported surveys revealed thirteen above tolerance readings. A maximum count of 1000 c/m was found on the floor around a rough pump in K-305-7 line recorder station. All above tolerance locations were decontaminated.

Spot Surveys - (Radiation Hazards Department):

A survey conducted on March 11 revealed above tolerance contamination at line recorder stations, in small areas on the floor around the manifold pumps and at the sample point connection.

K-305-12 through K-312-3 Area V Cascade Buildings

Routine Surveys - (Operating Group):

Five (5) reported surveys revealed sixteen above tolerance readings in the line recorder stations. A maximum count of 9700 c/m was found on the floor near a rough pump in Building K-306-4. It was possible to transfer 3900 c/m of this material. The majority of the above tolerance readings were found on the floor around rough pumps. All above



tolerance locations were decontaminated to below tolerance levels at the conclusion of each survey.

Spot Surveys - (Radiation Hazards Department):

Above tolerance contamination was found in a 1 ft² area on the floor of line recorder stations K=306=3 and 4. The Hoke sample connection in K=312=2 was also above tolerance with a reading of 1344 c/m. Subsequent surveys indicated that the material found on previous surveys had been decontaminated. Contamination in the line recorder stations in this area has now been reduced to a level that presents little or no hazard to personnel. Operations responsible for contamination are immediately monitored and followed by decontamination if necessary.

K_305_12 Product Cylinder Head Repair Room

Routine Surveys - (Operating Group):

Fourteen (14) reported surveys were made during the month, revealing approximately 86 above tolerance locations, the highest being 19,000 c/m found on a drainboard. A pair of gloves checked revealed a wipe count of 3600 c/m. The majority of the contamination were found on work tables and a bellows rack. Four (4) airborne samples taken were below tolerance. Above tolerance areas are decontaminated daily.

Spot Surveys - (Radiation Hazards Department):

In this locale, product cylinder heads are repaired and vacuum tested before use in product withdrawal. The majority of the above tolerance readings, as revealed by three (3) surveys, were found on the work bench and on a rack used for storing the valve bellows. The work bench has been covered with stainless steel to facilitate decontamination. Maintenance and vacuum test personnel wear gloves and coveralls when handling the contaminated cylinder heads. At present, personnel working in this area are required to have hand checks taken with an instrument located at the K-306-7 building. When instruments are available, a hand counter will be stationed at the shop.

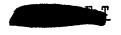
K_306_6 Product Cylinder Assembly

Routine Surveys - (Operating Group):

Thirteen (13) reported surveys revealed 38 above tolerance readings. Counts as high as 51,000 c/m were found on cylinder flanges. It was possible to transfer 7600 c/m of this material. Other above tolerance contamination was found on work tables and gloves used during assembly operations. An air count of 1.09 c/m/ft³ was the highest recorded reading of five samples taken.

Spot Surveys = (Radiation Hazards Department):

Alpha emitting material found in this area is the result of handling contaminated cylinder flanges. Four (4) spot surveys showed above tolerance readings on the product cylinder holder, on product cylinder heads and





on gloves used by the operators. Arrangements have been made for the Y-12 plant to use a separate set of cylinder ring flanges in their process. This will permit the existing flanges to be free of contamination and should improve conditions in this shop.

K-306-7 Product Withdrawal Room

Routine Surveys - (Operating Group):

Eighteen (18) reported surveys were conducted during the month, revealing 125 above tolerance readings. Counts as high as 2850 c/m were found on the cylinder defroster, 1140 c/m of this material could be transferred. The majority of the above tolerance readings were found on the defroster and air exhaust ducts. Of the daily continuous airborne samples taken, one was reported at tolerance, with a count of 2.11 c/m/ft³ in a location seven feet from the product withdrawal manifold.

Spot Surveys - (Radiation Hazards Department):

Four (4) spot surveys conducted in this locale revealed above tolerance areas inside of a hooded cylinder defrosting unit, inside of a hooded hot box, and on gloves worn by the product withdrawal operators. These hood installations are used for the protection of personnel during operations that are known to be responsible for surface and air contamination, therefore, contamination will exist on the inside surface of the hot box and defroster unit during normal operations. Decontamination operations are performed, however, to prevent build-up of material. Gloves are worn by operators whenever handling the product cylinders and during connecting and disconnecting operations. Hand checks are taken before smoking, eating and at end of shift, or at such times when the operators or visitors leave the product withdrawal area.

K-312 Building Basement and Cold Trap Rooms

Routine Surveys - (Operating Group):

Seven (7) reported surveys conducted in the K-312-1 basement revealed 135 points above tolerance, the highest being 33,000 c/m with wipe counts of 27,000 c/m. Of eighteen (18) airborne samples taken, none were reported above tolerance. A single survey reported, conducted in the K-312-3 cold trap room revealed two above tolerance readings around #2 and #3 Beach Russ Pumps, the highest being 2296 c/m. It was possible to transfer 1312 c/m of this material. These locations have been decontaminated.

Spot Surveys - (Radiation Hazards Department):

One (1) survey conducted on March 9th revealed above tolerance alpha contamination on miscellaneous articles located in the K-312-3 Cold Trap Room. Four (4) surveys conducted in the basement in the vicinity of the K-312-1 Valley Iron Pumps indicated above tolerance readings as high as

¹ Letter to A. P. Huber from M. F. Schwenn, March 29, 1948





4300 c/m on the Valley Iron Pumps. This material originates from a carbon type seal used in this building. Preliminary tests are being made for the design of a cover to prevent spread of contamination from the pump shaft.

Area I Cascade Buildings - K-402-1 through K-402-9

Spot Surveys - (Radiation Hazards Department):

A survey conducted on March 18th revealed above tolerance readings on a wooden box used in the K-402-9 Line recorder station. In the pipe gallery on the west wall of the feed filter an above tolerance reading of 2508 c/m was found which resulted from a material release in the past. A check on a mobile feed unit located on the cell floor in building K-402-4 revealed no above tolerance contamination. Supervision was notified of the above tolerance locations.

K-300 and K-400 Process Area Instrument Shops

Routine Surveys - (Operating Group):

Weekly routine surveys were started this month in the process instrument shops. Alpha activity up to 1500 c/m was found in the K-305-8 shop, and up to 3000 c/m in the K-301-4 shop. Both contaminated spots were of small area and have since been decontaminated.

Spot Surveys - (Radiation Hazards Department):

One spot survey was made at each of the following shops during the month of March: K-301-4, K-303-7, K-305-9, K-305-10, K-402-9. In the K-303-7 instrument shop, above tolerance surface activity was found as the result of a material release reported in the "Material Release" section.

The only contamination normally to be expected is from interior surfaces of equipment.

It is believed that the weekly surveying of these shops by the operating groups will make it possible to maintain below tolerance conditions.

K-300 and K-400 Area Process Maintenance Shops

Routine Surveys - (Operating Group):

1. K-311 Mechanical Maintenance Shop

One survey reported four (4) above tolerance readings. A count of 2686 alpha c/m was found on the floor with possible transfer of 269 c/m.

2. K-302-5 Mechanical Maintenance Shop

Three (3) reported surveys were made during the month of March. A total of seventeen (17) above tolerance readings were recorded. All above tolerance readings found were on seal replacement equipment, the highest being 3780 c/m found on a seal tray.



3. K-402-9 Mechanical Maintenance Shop

One (1) reported survey indicated a total of five (5) above tolerance readings. These readings were found on pieces of flexible hose located within the shop. The maximum reported count was 3117 c/m.

4. K-312-2 Valley Iron Pump Shop

One (1) recorded survey revealed two above tolerance readings, the highest being 1200 c/m found on the floor in front of a work bench.

Spot Surveys - (Radiation Hazards Department):

Above tolerance readings were found in the K-311-1 shop. Readings as high as 2150 alpha c/m were found on the floor. It was possible to transfer 215 c/m of this material. This contamination is the result of work performed here in the past. Supervision was notified of this condition and decontamination action was to follow. An above tolerance reading of 860 c/m was found on a seal puller in the K-302-5 maintenance shop. All readings taken in the K-303-1, K-310-3, K-302-1, K-402-9, and K-309-3 maintenance shops were below tolerance.

K-300 and K-400 Process Area Maintenance Jobs

Routine Surveys - (Operating Group):

Approximately 16 A.C. Pump seal replacements and four A.C. Pump replacements were monitored during the month. The majority of air samples taken during seal and pump replacements were above tolerance. In most instances the air contamination remained above tolerance while the new seal was being installed. Air samples, taken after the pumps had been pulled and during the operation of cleaning the pump housings, were above tolerance. Only a few above tolerance surface readings were found on the A.C. pumps and on the floor in the vicinity of the pumps during and after seal changes. Several above tolerance counts were found on tools and equipment used by maintenance personnel during seal and pump replacement operations. In the majority of cases, above tolerance counts were found on maintenance personnel coveralls and gloves at the conclusion of seal and pump replacement work.

Spot Surveys - (Radiation Hazards Department):

Seal Change K-303-5, Cell 5

During the outer seal removing operation an above tolerance airborne count of 270.3 alpha c/m/ft³ was reported. A second above tolerance air sample of 632.7 alpha c/m/ft³ was recorded during the operation of removing the inner seal. Protective equipment in the form of coveralls, masks and gloves is worn by those engaged in these operations. Monitoring of coveralls worn by the maintenance personnel revealed counts as high as 1350 c/m.

Seal Change K-305-5 Cell 10

An above tolerance air sample of 694.0 alpha c/m/ft3 was recorded



after the seal had been removed (gas masks worn). A second sample taken 20 minutes later during the operation of installing the new seal (gas masks not worn) revealed an air sample count of 1.9 alpha c/m. Above tolerance contamination was found on gloves and equipment used in seal changing operations.

K-1031 Building Contaminated Carbon and Equipment Storage

Spot Surveys - (Radiation Hazards Department):

Spot survey conducted in this locale revealed above tolerance material on the top of a process material cylinder and on a Welch pump in storage. Readings as high as 5300 c/m were taken. It was possible to transfer 2688 alpha c/m of the material on the Welch pump.

K-1004 Laboratories A, B, C & D

Sampling Section

Room 19-A (Vapor transferring, preparation of sample cylinders for analysis, decontamination and resealing for return to Process)

Routine Surveys - (Operating Group):

The results of four surveys this month showed consistent high contamination levels. Alpha surface activity was high, and no effective measures were found to correct these conditions. Alpha readings remained at substantially the same level despite repeated decontamination. An order was written to install stainless steel working surfaces, but the installation was not completed until the end of the month. Surface contamination readings during the month had remained at a consistent average of over 2000 alpha c/m with individual readings up to 10,500 c/m. Frequent decontamination held wipe test counts low, though in one instance transferable activity at 7000 c/m was found. This was due to a fresh spill which was immediately decontaminated. Air samples were well below 0.5 alpha c/m/ft³.

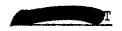
Spot Surveys - (Radiation Hazards Department):

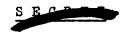
In one of two Health Physics inspections alpha surface activity up to 6720 c/m was found at one point on the floor in this room. However, no transferrable material was found. Other reading agreed with the operating groups surveys. Airborne alpha activity was very low, while beta-gamma activity was negligible.

Room 20-A (Freezing point determination, Fluorocarbon analysis)

Routine Surveys = (Operating Group):

Four routine surveys were made this month, the first survey - taken on the 8th, found this location entirely below tolerance. Subsequent surveys showed a gradual increase to readings as high as 3000 alpha c/m, not transferrable. Airborne activity was not present.





Spot Surveys - (Radiation Hazards Department):

Two Health Physics inspection spot checks confirmed the above findings. A survey made on the 8th found no above tolerance activity while the second, made on the 25th, located activity up to 2500 alpha c/m, not transferrable. Beta-gamma and airborne alpha activity was negligible.

Room 215-C (Inertness Testing, Oxide Fluorination)

Routine Surveys - (Operating Group):

This room remained below tolerance throughout the month, as shown by a four routine surveys until a survey on the twenty-fifth revealed alpha activity up to 1200 c/m at one hood and on the surrounding floor. This was decontaminated by the twenty-seventh, but in that survey the floor near a second hood showed activity up to 1600 alpha c/m.

Spot Surveys - (Radiation Hazards Department):

A survey of this location, early in the month, found no alpha activity, either surface or transferrable above allowable limits.

Equipment and Waste Solution Storage Cages

Routine Surveys - (Operating Group):

Only one routine survey of these locations was made. The concrete floor of the solution cage was found to have surface activity beyond the upper limit of measurement of the Victoreen 356 portable alpha survey meter; which reads to 30,000 alpha c/m. This is explained by fact that a drum stored there in the past, leaked, allowing active solution to spread over the porous floor. This activity is apparently not transferrable, but since it does represent a potential hazard, action to remove it is under study.

Other surfaces in the solution storage cage showed activity at the tolerance level, while the equipment cage had none.

Spot Surveys - (Radiation Hazards Department):

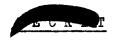
A Health Physics inspection showed general area activity just below tolerance, but confirmed the high floor contamination. Beta-gamma activity was found to be above background, but less than one-tenth of tolerance value.

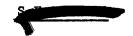
Physics Research Section

Room 18-A (Instrument Construction, Tracer Work, UX Extraction.)

Routine Surveys - (Operating Group):

Routine surveys in this room and in Room 23 are made by the operating group during operations, and are not, so far, formally reported. All regular precautions are observed, however, whenever the nature of the operations in progress demand.





Spot Surveys - (Radiation Hazards Department):

A Spot Survey made in this room on the tenth located one point where above tolerance contamination, up to 2368 alpha counts per minute could be detected. This location, on the surface of a work bench, had no transferrable activity. A second survey, made on the twenty-fifth revealed that the spot had been decontaminated. No other alpha contamination could be found. Airborne alpha activity was at background level.

Room 23-A (Radioactivity Measurements)

Spot Surveys - (Radiation Hazards Department):

Two surveys in this room during the month located several points where alpha activity levels were fairly high. An area on the work surface inside of a hood gave surface readings up to 5400 alpha counts per minute. An area on the floor in front of the hood showed activity beyond 30,000 c/m. A hot plate gave a surface activity over 8500 alpha counts per minute. While none of these locations are ordinarily subject to direct personnel contact, and the contamination was not transferrable, decontamination to below tolerance levels is always recommended. No airborne alpha activity, above background, was present in this room.

Uranium Analysis Section

Room 101-B (Final malyses, Including Gravimetric, Colorimetric X-ray, and Spectrome ric Determinations)

Routine Surveys - (Operating Group):

Eight surveys taken this month showed this room to be below tolerance. One localized point on the spectrometer table, read 1000 alpha c/m on one occasion, but was immediately decontaminated.

Spot Surveys - (Radiation Hazards Department):

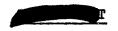
A Health Physics inspection on the seventeenth found no radioactivity hazards at this location.

Room 105-B (Chemical Analyses, Hydrolysis, Extraction, Preparation)

Routine Surveys - (Operating Group):

Nine routine surveys made in this room showed a gradually increasing activity level during most of the month. Decontamination was limited to localized areas where activity had been found high, or where known minor spills had occurred. A more extensive decontamination late in the month gave better results, and the routine surveys of the twenty-sixth and thirty-first showed maximum activity readings of 1800 alpha c/m. Previous surveys had shown activities up to 4500 c/m. These were decontaminated. The only point not successfully decontaminated was a point on the floor under one hood. This averaged higher than 3000 alpha c/m.

While the general activity levels in this room during March were above



tolerance, regular decontamination kept wipe test results low, two surveys showing no transferrable activity at all, and air counts were at background level.

Spot Surveys - (Radiation Hazards Department):

Two Health Physics spot surveys made during the month reported one additional point of contamination. A sink top having activity up to 2688 alpha c/m was found. Other points were as reported by the routine surveys. Airborne activity was found to be negligible.

Room 111-B (Simple Weighing, Sample Alignating)

Routine Surveys - (Operating Group):

Eight routine surveys of the Uranium Analysis section balance room showed that regular decontamination was keeping activity levels low. Isolated points of contamination appeared from time to time, but were regularly removed, and at no time did the activity exceed 1200 alpha c/m. Since spillage at this location is very slight, contamination transfer seems the probable explanation for the activity observed. Better decontamination in the adjoining room should give effective control of this location.

Spot Surveys - (Radiation Hazards Department):

One spot survey showed two points, on two adjacent tables where alpha activity was 900 and 1050 alpha c/m respectively. All other equipment was below tolerance.

Room 115-B (Sample Receiving, Control, Distribution, Storage)

Routine Surveys - (Operating Group):

Seven surveys this month showed this room to be free of above tolerance activity until the twenty-sixth, when a spot on the floor having 2400 alpha c/m appeared. This was decontaminated within three days, the next survey showing it to have been reduced to 600 c/m. A wheeled dolly located in this room, in a survey on March fourth, showed transferrable activity of 480 alpha c/m. This was reduced to zero, as reported in a subsequent survey.

Spot Surveys - (Radiation Hazards Department):

A Health Physics inspection spot survey on March seventeenth showed no above tolerance contamination in this room.

Room 170 (Formerly Used for Grinding Operations)

Routine Surveys - (Operating Group):

Eight routine surveys made this month showed both surface and transferrable activity well above telerance levels in the vicinity of the Uranium Analysis Section's installations. All this contamination is left from previous operations, since the equipment in this room is no longer in use. Although neoprene gloves, respirators and long coats were worn while grinding operations were in progress it was felt that contamination levels were



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too high and the operation was discontinued in January, and moved to antermore where grinding is accomplished by hand under a hood. The machines are now disconnected, and complete decontamination and storage is planned. Surface activities on the mills, work tables, and equipment average 2500 alpha c/m, wipe tests average 500 counts/m. No air samples were taken this month, previous samples having shown below tolerance counts.

Counting Section

Room 104-B (Gravimetric Analysis, Weighing, Evaporation, Solution Preparation, etc.)

Routine Surveys - (Operating Group):

Of nine routine surveys made this month, four found this room completely free of above tolerance alpha contamination. A sample tube rack which had activity up to 2600 alpha counts per minute, a foot stool and a section of floor under a hood, which had surface activity up to 1500 alpha counts per minute, were reported in the first three surveys; had been successfully decontaminated by the fourth survey which was made on the eleventh of March. Contamination began to appear again on the twenty-sixth when several areas up to 1600 alpha counts per minute were found, but these were removed before the end of the month. Transferrable contamination remained at or below the tolerance level throughout the month and no airborne activity was found.

Spot Surveys - (Radiation Hazards Department):

Two Health Physics spot checks located several points, up to 2000 alpha counts per minute, which were subsequently decontaminated. Airborne activity remained at background level and no transferrable contamination was found. It was noted that regular precautions such as regular use or noods, wearing of rubber gloves, use of tongs and tweezers, use of container racks, frequent decontamination, all were exercised in handling active material.

Room 108-B (Uranium Plating, Disc Preparation, Solution Preparation)

Routine Surveys - (Operating Group):

Of nine routine surveys made during the month six showed below tolerance conditions for all installations in this room. On the twenty-second, a survey revealed four above tolerance spots on work surfaces one of which gave 6000 alpha c/m. of surface activity and 1440 transfer-able alpha counts. In a survey on the twenty-sixth this had been reduced to 1700 surface c/m. and 790 transferrable c/m. A final survey on the twenty-ninth found the transferrable activity removed entirely. The newly inaugurated policy of frequent decontamination has kept most installations clean.

Spot Surveys - (Radiation Hazards Department):

Two spot surveys located several points not reported in routine checks. One sink apron gave readings up to 14,185 surface alpha c/m. and 5028 transferrable e/m. This was either missed by the routine surveys or removed by the periodic decontamination. Other points ranged from 2000 c/m down to

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below tolerance activities. Airborne activity was at background level.

Room 114-B (Counting Room Handling of Plated Disk Uranium Samples and Filter Paper Air Samples.)

Routine Surveys - (Operating Group):

Nine surveys in this room found no activity above 300 c/m on any surface. No transferrable activity was present at any point.

Spot Surveys - (Radiation Hazards Department):

Two spot surveys by Health Physics monitors found no appreciable surface or transferable alpha activity in this room. Air counts gave background readings only.

Room 116-B (Fission Counter Installations)

Routine Surveys - (Operating Group):

Five radiation checks found no alpha activity in these rooms, either on the floor and walls, or on the fission counter installations.

Spot Surveys - (Radiation Hazards Department):

One Health Physics spot survey located no above tolerance alpha activity, confirming the Operating Group's results.

Rooms 119 and 121-B (Counting Section Offices)

Routine Surveys - (Operating Group):

These two rooms, the offices of the section supervisor, are checked to locate possible contamination brought in on shoes or by samples or equipment that might occasionally pass through these offices. As such, they are of interest, to afford a means of studying the possibility of spreading contamination. Of seven surveys made during the month, only one gave completely negative results, the remaining six showing readings on floor, desk tops and chairs that were below 300 c/m.

Room 122-B (Solution Preparing, Evaporating, Titrating, Weighing, Testing, Transferring, Igniting, Furnaceing)

Routine Surveys - (Operating Group):

Nine routine surveys in this room showed the effectiveness of frequent decontamination, but pointed out even more strongly the value of regular procedures designed to prevent initial contamination. Two



contamination were found. One on a chair seat reached 1600 alpha c/m, the other, on several boxes inside a hood showed activity up to 3000 c/m. All wipe tests were negative. Both these points were decontaminated before the end of the month. The last survey showed no above tolerance readings. No air samples were taken.

Conditioning Section (General Chemical Analyses, Involving Some Process Materials and Residues)

Routine Surveys (Operating Group)

Four surveys were made in this section during March. Of several above tolerance readings found, an average figure of 1000 alpha c/m on work surfaces and equipment was reported. One ring stand base was found to have 30,000 alpha c/m on the surface, with 627 c/m transferable, and a hood surface was found with 13,500 alpha c/m and 330 c/m transferable. While the results were generally good, enough above tolerance points were found to indicate that additional study to remove contamination sources is still needed. Regular decontamination of observed high activity points was carried out after each survey, as indicate by the fact that no point appeared for two successive surveys; but as in all laboratory locations it is seen here that continuous alpha monitoring or the adoption of spill proof operating procedures and equipment are necessary for complete freedom from alpha activity hazards.

Critical Mass Section

Routine Surveys (Operating Group)

Two sets of ten air samples each were taken in the Critical Mass Laboratory in the F-05 Building. The first set, taken on March fifth, showed no appreciable airborne activity, the only samples not showing zero count being three which were, respectively 0.07, 0.04 and 0.02 alpha c/m/ft³. The second set showed readings almost as low, except for two readings at a reactor which gave results of 13.5 and 15.6 alpha c/m/ft³. Operation of this unit was immediately discontinued, and work is now in progress on the design and construction of an enclosed reactor which will not present this hazard.

K-1024 Instrument Building (Electronic Instrument Shop)

Routine Surveys (Operating Group)

One routine survey made this month located a number of above tolerance locations probably caused by past accumulation of active material. Six small area work surfaces were found alpha active, the highest being 7000 c/m. All such spots are being decontaminated. One electronic instrument received for repair had 30,000 c/m on the panel, and a non-destructive method of decontamination is being studied. Line Recorders are disassembled for decontamination in the shop, and interior equipment surfaces are frequently radioactive.

Spot Surveys (Radiation Hazards Department)

Spot surveys this month located above tolerance alpha activity in only





material has not been possible, protective clothing in the form of coveralls, gloves and special shoes or shoe covers are worn by both operators and visitors when inside of this building. Operators working in this area are required to have hand counts taken before eating and at the end of shift.

K-1300 Area Change House

Supervision has required all personnel who are engaged in equipment decontamination, oxide grinding, weighing and fluorination operations to change from their street clothing to protective clothing furnished, and change house facilities have been provided for this purpose. At the end of each work period or upon completion of any particular job in a contaminated area, these persons take showers and don clean protective clothing or their street clothing, as the case may be. At the present time, the change house is divided into two (2) sections which are separated by a small ante-room. In one section lockers to hold protective clothing are provided, together with shower provisions. In the other section, connected by this ante-room, are lockers for street clothing. Located within the ante-room is a Poppy alpha detector for taking hand counts.

K-1401 Pilot Plant-Engineering and Development Division

Spot Surveys (Radiation Hazards Department)

A survey conducted on March 22nd revealed above tolerance contamination as high as 14,000 alpha c/m on a two (2) ft² area on the floor under #1 tube rack. It was possible to transfer 1140 alpha c/m of this material. The contamination on the floor can be attributed to material releases here in the past. Above tolerance locales were decontaminated. Operators wear gloves when connecting and disconnecting product and sample cylinders.

K-1401 Building (Maintenance Shops)

AC Pump and Seal Shop

Routine Surveys (Operating Group)

Daily alpha surface readings are taken of work surfaces and equipment in use. No above tolerance readings are reported.

Spot Checks (Radiation Hazards Department)

Such items as a hot plate, pump shafts, and seals are stored in one isolated corner of the shop. The items are known to be contaminated, and are avoided by personnel working in the area. Four spot surveys this month found activity only on known contaminated stored items. Several contaminated stage pumps were overhauled during the month using suitable safety equipment and effective cleanup procedures, which insured the maintenance of safe working conditions.

Since known contaminated items are handled with proper protective equipment the hazard to personnel is small at this time. (See Hand Count Section.)





Valve Shop

Routine Surveys (Operating Group)

Weekly surveys found no alpha activity above permissible limits on work surfaces and tools.

Spot Surveys (Radiation Hazards Department)

Although three spot surveys made this month disclosed no above tolerance activity on work surfaces, a number of process valves were found being repaired while contaminated as high as 19,800 c/m with up to 800 c/m transferable. These valves had been decontaminated before entering the shop, but since all the activity had not been removed, they were subsequently rerouted to decontamination.

Vacuum Pump Shop

Routine Surveys (Operating Group)

Daily alpha surveys confirmed the general cleanliness of the shop, and located several above tolerance small area spots which were promptly corrected. A canvas cover over the small vacuum pump degreaser rack had 10,000 c/m on it, and was replaced by a metal curtain to facilitate future decontamination. The Welsh pump lapping block and table were alpha active up to 1080 c/m. Previously installed table coverings, and painted surfaces made clean-up relatively simple.

Spot Surveys (Radiation Hazards Department)

The results obtained on four spot surveys during the month of March substantiated those of the operating group.

Scrap Enclosure, Cleaning Area, and Safety Equipment Shop

Routine Surveys (Operating Group)

All safety equipment was monitored after decontamination, in order to separate items which were still alpha active. All pieces of safety equipment still radioactive are not re-issued, but are stored because of the possibility of development of a more effective decontamination process.

Several hundred valves and valve fittings in the cleaning area, suspected of being contaminated, were monitored for alpha activity. Approximately 10% of the items checked were contaminated, a few as high as 15,000 c/m. These parts were subsequently decontaminated.

Spot Surveys (Radiation Hazards Department)

Spot Surveys of the Safety Equipment Shop confirmed the desirability of continuing the procedure of monitoring all safety equipment before reissue.

The cleaning area work surfaces and floors were found free of alpha activity on a spot survey, and the contaminated valve parts found by the





operating group were tagged "contaminated".

In the scrap and salvage area several valve parts were found contaminated, awaiting decision as to whether to repair the parts for re-use or send to the "hot" scrap yard.

The work surfaces in the area were free of activity.

K-1405 Chemical Engineering Development Building

Routine Surveys (Operating Group)

No surface readings were recorded, all air samples taken were below tolerance.

Spot Surveys (Radiation Hazards)

Two (2) surveys were conducted in this area. Above tolerance readings were found on equipment used in handling alpha emitting materials. Counts as high as 4560 c/m were recorded. A daily air sample program was started this month. Hand counts are taken daily before lunch and end of shift. Protective equipment in the form of coveralls, gloves and shoes are worn when conducting experiments with uranium materials.

K-1410 Carbon and Alumina Storage

Spot Surveys (Radiation Hazards)

the floor in the vicinity of a carbon and alumina separator. It was possible to transfer 556 c/m of this material. Readings as high as 3336 c/m were found on the floor in an area around the carbon sampler. It was possible to transfer 1116 c/m of this material.

IV. PERSONNEL MONITORING

Hand Counts

K-306-7 Product Withdrawal Station

Hand counts of product withdrawal and coded chemicals operators are taken and recorded daily before lunch and at end of shift. Visitors upon leaving the SS area, which comprises the product withdrawal, weighing and storage rooms, are monitored. However, these readings are not recorded. No final above tolerance hand counts were recorded this month.

K-305-9 Change House

Hand checks of persons leaving the RR area are taken. Approximately 1,752 persons have been so monitored during this month. Several above tolerance readings were taken which indicated the necessity for the hand check program. However, all final readings were brought to below tolerance.





K-1405 Chemical Engineering Development Building

Hand counts are taken before lunch and at end of shift. No above tolerance final counts were reported this month.

Film Badges

An average of one hundred seventy-five (175) film badges per week were issued throughout K-25 during the month of March, an increase of twenty-five (25) badges over the month of February. Their use was divided between personnel and stationary monitoring as follows:

	Stationary	Personnel
Critical Mass Laboratory	6	10
Emergency Monitoring	13	40 #
Engineering Development	5	, .
Health Physics Inspection Section	⇔ ≃	5
Instrument Development Section	යා සි	4
Laboratory Division	4	58
Process Division	43	27

In addition four (4) Neutron films were used each week in stationary locations in the Works Laboratory and the Critical Mass Laboratory.

Results

Film badge results indicated no over tolerance radiation to personnel except for one individual working in the K-1303 decontamination room. The badge used March 12 - 19, 1948 gave the following:

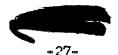
Open Window - 1470 mrep
Shield - Less than 30 mrep

The equipment and processes are such that it is probable that the beta radiation was from UX_1 and UX_2 , thus the high reading. This individual's film badge results for several weeks before and after the period under discussion revealed negligible quantities of radiation. Badges worn by other personnel at this location have been consistently low. The direct cause of the high reading has not yet been ascertained.

V. PROCESS MATERIAL RELEASES

K-101 - C-816 Stripping Building - March 16, 1948

A thirty (30) second release occurred while pressure testing.





A small quantity of vapor was released through a leaky sight gauge. Fiv (5) men were sent to dispensary. The highest alpha surface count was 27 c/m. No air samples were taken. No further work was done until the are was decontaminated to below tolerance.

K-131 - Feed Purification Building - March 11, 1948

A 1 to 3 minute release occurred due to a faulty packing gland on a feed valve, which was not evident until heat was applied. Three (3) men were sent to dispensary. All surface readings were less than 100 c/m. No air samples were taken.

K-131 - Feed Purification Building - March 16, 1948

Damage to a valve packing gland, probably caused by a bent valve st resulted in a three (3) minute material release when the valve was opene Two (2) men were sent to the dispensary. All surface readings were belo tolerance. An air sample taken 30 minutes after the release gave an air activity of 0.5 alpha $c/m/ft^3$.

K-631 - Waste Disposal Building - March 19, 1948

A minor release of material resulted when a G-74 line leading to a Beach Russ type shaft seal was cut prior to removal of the pump from ser No one was sent to dispensary. All surface readings were below tolerance.

K-306-7 - Product Withdrawal Room - March 1, 1948

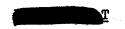
A release of one (1) minute duration occurred at a product cylinder plug while the cylinder was being defrosted. One (1) man was sent to the dispensary. Highest surface count was 3520 c/m on the cylinder plug. After decontamination, a count of 1479 c/m still remained on the product cylinder. The overall atmospheric activity for the day was below tolera

K-306-7 - Product Withdrawal Room - March 6, 1948

A release of thirty (30) seconds duration occurred when the outlet valve of a product cylinder was opened during the operation of flashing material from the cylinder to the cascade. Since the cylinder was local within the hooded dry box at the time of release, no one was sent to the dispensary. Highest surface reading found in a survey immediately after the release was 1620 c/m found inside the dry box on position #1 base plate. Highest airborne alpha was .024 c/m/ft³ taken five (5) minutes after the release six (6' ft. from the point of release. The affected area was decontaminated to below tolerance.

K-306-7 - Product Withdrawal Room - March 10, 1948

A release of 20 seconds duration occurred as the result of a leak in a cylinder gasket. Four (4) men were sent to the dispensary. Highes surface count was 3444 c/m, found on the side plug of the cylinder. Aft decontamination, the surface count was 100 c/m. Immediately after the release, the airborne activity was found to be less than tolerance.





	<u>Date</u>	Group	<u>Personnel</u>	Number of Persons Present	Location Of Lecture
	3/18/48	Design & Development Division	Technical Engineers	Approx. 20	K-1401
	3/19/48	Design & Development Division	Technical Engineers	Approx. 20	K-1401
(2		Design & Develop- ment Division	Technical Engineers	Approx. 35	K-1401
	3/24/48	Laboratory	Technical	Approx. 50	K-1005



APPENDIX

Included in the Appendix is "Water Survey Program", consisting of four (4) pages.

AFTENLLA

WATER SURVEY PROGRAM SUMMARY

March, 1948

14-開	21-頃	10-W	16-羽	12-1	24-D	13-Д	SAMPLE NUMBER
Influent to Sanitary Sewage Disposal Plant.	S-50 Sewer Outfall.	Clinch R. immediately below S-50 sewer outfall.	K-25 & K-27 Drinking Water	Glinch R. in- fluent to K-25	Effluent from K-25 Water Puri-fication Plant	Glinch R. Efffluent from K-25	LOCATION
. 21	21	1- 20	20	20	99	100	ANALY TOTAL SAMPLES
15	Уı	20	20	20	99	100	ANALYSIS RESULTS TAL LESS THAN PLES FIVE PPB
Vi.	N	0	0	0	. 0	o	THROUGH FEBRUARY FIVE THRU OVE TWENTY PPB TWENT
ш	14	0	0	0	0	0	BRUARY OVER TWENTY PPB
Weekly	Weekly	Weekly	Weekly	Weekly	Daily	Daily	PRESENT SAMPLING Fresuency
Same	Same	Same	Same	Zero	Daily	Weekly	PROPOSED SAMPLING FREQUENCY
Uranium	Uranium Fluoride	Uranium Fluoride Alpha	Uranium Fluoride Alpha	Uranium Fluoride Alpha	Uranium Alpha Beta	Uranium Fluoride Alpha	PRESENT ANALYSIS
Same	Uranium	Same	Same	None	Same Add Fluoride Determi- nation once/wk.	Same	PROPOSED ANALYSIS
Duplicates the sample which follows.	m			Duplicates Sample 24-D.	Move sample to influent line.	Sample of river bottom mud to be taken at the same time.	REMARKS





WATER SURVEY PROGRAM SUMMARY (CONT'D)

28-M	22-1	17-11	11-W	1-11	6 · · · · · · · · · · · · · · · · · · ·	15-頃	Sami Le Number
Crossing of Bear Creek at Oak Fidge Turnpike.	Poplar Creek	Process Recirculating	Poplar Greek influent to K-25	Poplar Creek Inlet NE of K-303-8	K-27 Drainage into Poplar Creek.	Sanitary Sewage Disposal Plant Effluent	MOTTHORY
	21	21	21	21	20	t 21	ANALYSIS TOTAL LES SAMPLES FIV
	21	21	20	17	6	19	SIS RESULTS LESS THAN FIVE PPB
	0	0	Ъ	4	11	N	S THROUGH FEBRUARY FIVE THRU OVER TWENTY PPB TWENTY
	0	0	0	0	w	0	GBRUARY OVER TWENTY PPB
	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	PRESENT SAMPLING FREQUENCY
Monthly		Monthly	Same	Same	Same	Same	PROPOSED SAMPLING FREQUENCY
	Uranium Fluoride Alpha	Uranium Alpha	Uranium Fluoride Alpha	Uranium	Uranium	Uranium	FRESENT ANALYSIS
Uranium Alpha Beta		Same	Same	Same	Same	Same	PROPOSED ANALYSIS
New point at request of AEC to monitor Scrap Yard.		Two monthly samples, one for K-25 and one for K-27 have been proposed	This point has been moved upstream to the mouth of the East Branch of Poplar Creek.	or each system covered by these points will be taken.	of the Uranium found in these samples. Several additional samples	A study is now in progress to determine the sources	REMARKS



WATER SURVEY PROGRAM SUMMARY (Cont'd)

9	8	5 <u>-</u> M	4- M	3- E	2-1	20- 1	SAMPLE
Clinch River off5 shore of Jones Scrap Yard.	Drainage to Clinch River from Hot Scrap Yard.	Drainage from Process Bldgs. into Poplar Creek	Drainage from Process Bldgs. into Poplar Creek	Drainage from Process Build- ings into Poplar Creek	Drainage from Pond S.W. o. Garage Area Poplar Creel	Cafeteria Cook- ing Water	E LOCATION
off-5	ар 5	cu G B	SA E	රු ස ර	f into	ok- 17	ANAL. TOTAL SAMPLES
C II	CT .	O 1	ζī	C 1	CI	17	KSIS RESULTS THROLESS THAN FIVE PPB TWENT
0	0	o	0	0	0	•	ANALYSIS RESULIS THROUGH FEBRUARY TAL LESS THAN FIVE THRU OV PLES FIVE PPB TWENTY PPB TWENT
0	0	0	0	•	0	0	EBRUARY OVER IWENTY PPB
Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Weekly	PRESENT SAMPLING FREQUENCY
Same	Same	Same	Same	Same	Zero	Same	PROPOSED SAMPLING FREQUENCY
Uranium	Uranium Alpha	Uranium	Uranium	Uranium	Uranium	Uranium Fluoride Alpha	PRESENT ANALYSIS
Same	Same	Same	Same	Same	None	Same	PROPOSED
						Despite consistant negative results, this point is sufficiently important to warrant continuance.	REMARKS



WATER SURVEY PROGRAM SUMMARY (Cont'd)

26-M	25-M	23_M	19-M	18-W	SAMPLE
Drainage from Labs. A, B, C and D.	Clinch River above Elza Gate.	Groundwater at K-1239 Sludge Pit.	Powerhouse Intake	Powerhouse discharge	LOCATION
44	44	4	C I	ĊΊ	ANAL TOTAL SAMPLES
W	44	4	Cπ	¢π	LESS THAN FIVE PPB
0	0	0	0	0	ANALYSIS RESULTS THROUGH FEBRUARY TAL LESS THAN FIVE THRU OV PLES FIVE PPB TWENTY EPB TWENT
₽	0	, O	0	0	EBRUARY OVER TWENTY PPB
Monthly	Monthly	Monthly	Monthly	Monthly	PRESENT SAMPLING FREQUENCY
Same	Same	Same	Zero	Zero	•
Uranium Alpha	Uranium . Fluoride Alpha	Uranium	Uranium	Urenium	PROPOSED SAMPLING PRESENT PROPOSED FREQUENCY ANALYSIS ANALYSIS
Same	Same	Same	None	None	PROPOSED ANALYSIS
			Samples 12-W and 9-M cover this point.	Sample 19-M covers this point and no possibility of con tamination in Powerhouse exists.	REMARKS

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Oak Ridge, Tennessee

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SHEET

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CARBIDE AND CARBON CHEMICALS CORPORATION K-25 PLANT OAK RIDGE, TENNESSEE

> HEALTH PHYSICS ACTIVITIES FOR APRIL, 1948

Compiled by S. Visner

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Report Number K-178, Part IV

Date of Issue May 24, 1948

UNCLASSIFIED

Title:

Report of Health Physics Activities at K-25 Plant

for April, 1948

Author: S. Visner

CARBIDE AND CARBON CHEMICALS CORPORATION

K-25 PLANT

OAK RIDGE, TENNESSEE

SUMMARY

Herein are reported the Health Physics Activities for April, 1948, in the K-25 Plant. The results of radiation surveys, area and personnel monitoring, air sampling, and water survey program are presented. A summary is given of development work on instrumentation for radiation monitoring and also special problems involving the control of radioactivity hazards.

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I. INTRODUCTION

The following are the highlights in Health Physics developments for April, 1948 in the K-25 plant:

The program was continued of locating and removing radioactive contamination throughout the plant. The locations which are found contaminated are being decontaminated and special consideration is being given to modification of procedure and equipment to prevent the spread of radioactive contamination.

The operation of seal changing in the purge cascade of the plant was studied and extremely high levels of activities uncovered which required special precautions to be exercised during this type of operation.

A converter change was audited in the cascade which revealed that improvements were being made in personnel protection and monitoring.

Facilities are being designed for effective decontamination of equipment exposed to process material. Tests were made to determine the best type of decontamination. Also the air and surface contamination was measured in order to determine the effective methods of control. The indications were that nitric acid is an effective decontaminant.

The health problem was studied in the chemical engineering installation where uranium powders are handled. Protective equipment and appropriate personnel monitoring were specified.

The use of film pads finger monitoring was started during the month in the laboratories for the purpose of monitoring the amount of beta radiation that may be incident on the hands of personnel. This is in addition to the regular film badge.

The radiation survey instrument inventory and estimate of Second quarter needs of 1948 was completed. The data will be available in a separate report.

Investigations were made for the purpose of determining the properties and application technique of several plastic paints for treating surfaces in order to cover existing alpha contamination and to render future decontamination more feasible. Development of a suitable method of coating floors to make decontamination practical without sacrificing present non-skid qualities remains a problem.

The water survey program showed no change in the previously reported low contamination results.

Plant personnel attended the AEC Information Meeting at Brookhaven, New York from April 26 through April 28, 1948.

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The monitoring of radiation is performed routinely by the operating groups and on an auditing basis by the Health Physics Section of the Radiation Hazards Department.

II. ORGANIZATION

The plant organization with respect to administering the policies pertaining to the protection of personnel from potential radiation hazards remains essentially unaltered. The responsibilities and duties of the various groups concerned with the problems are listed in the report for October, 1947.

A health engineer has been assigned to the problems arising from the imminent operation of the new radio chemical laboratory.

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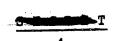




III. RADIATION SURVEYS

Routine surveys were conducted during the month by operating groups. All locations where above tolerance contamination is found on these surveys are decontaminated promptly. The locations for which surveys are formally reported and their frequency are as follows:

Location	Alpha Surfaces	Beta- Gamma	Air Samples
K-25 and K-27 Cascade Buildings (Line Recorders, Operating Floor, Pipe Gallery, Call Floor and Basement)	Wookly		As Required
K-101 C-816 Stripping Building	Monthly		
K-131 Feed Room	Twice Monthly	Daily	Twice Monthly
K-631 Tails Withdrawal	Twice Monthly	Twice Monthly	Twice Monthly
K-300 Coded Chemical Vaults	Twice Monthly		
K-305-12 Product Cylinder Head Repair Shop	Daily	allers and	As Required
K-306-6 Product Cylinder Assembly	Daily		As Required
K-306-7 Product Withdrawal Room	Daily		Daily
K-312 Building Basement and Cold Trap Room	Twice Monthly		As Required
K-300 Process Area Instrument Shops	Weekly	·	As Required
K-312 Valley Iron Pump Shop	Monthly		As Required
K-300 and K-400 Process Area Mechanical Maintenance Jobs	All Jobs		All Jobs
K-300 and K-400 Mechanical Maintenance Shops	Monthly		Recognition of the Collection
K-1004 Laboratories A, B, C, and D Sampling Section	Weekly	As Required	As Required
Radiation	As Required	As Required	As Required
Uranium Analysis	Twice Weekly	As Required	Monthly
Counting	Twice Weekly	As Required	Twice Monthly
Spectrometer	Weekly	As Required	As Required
Spectrometer Standards	Weekly	As Required	As Required





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Analytical Research	Weekly	As Required	As Required
Molecular Spectroscopy	Weekly	As Required	As Required
Metallurgy	As Required	As Required	As Required
Physical Chemistry	Twice Weekly	As Required	Twice Weekly
Conditioning	Weekly	As Required	As Required
Critical Mass	As Required	As Required	As Required
Barrier Research	Weekly	As Required	As Required
Special Analysis	Weekly	As Required	As Required
K-1024 Electronic Development Section	Weekly	·	
K-1301 C-216 Generation and Oxide Conversion Building	Weekly	Twice Weekly	Twice Weekly
K-1303 Decontamination	Weekly	Twice Weekly	Twice Weekly
K-1401 AC Pump and Seal Shop	Daily	annount might come	As Required
K-1401 Vacuum Pump Shop	Daily	As Required	As Required
K-1401 Safety Equipment Shop	As Required	the state of the s	managements (Printle - Classes)

In addition to the locations and frequencies listed above, it should be pointed out that several of the locations now have detection instruments available to them, and take many readings and partial surveys which as yet, are not formally reported to the Radiation Hazards Department. Surveys are also made during, or at the conclusion of special operations where contamination and radiation hazards are considered possible. Such surveys are indicated above "As Required".







In accordance with its responsibilities, the Health Physics Section conducted spot surveys on an irregular schedule.

The results of routine surveys made or authorized by operating groups and the results of spot checks made by the Health Physics Section are summarized for each location involved:

K_101 C-816 Stripping Building

Routine Surveys - (Operating Group):

One (1) reported survey revealed no above tolerance surface contamination.

Spot Surveys - (Radiation Hazards Department)

The results of surveys conducted in this area indicate that the majority of the contamination existing is found at the sampling connection, floor beneath the sampling point, and on the product removal flange connection. Material existing at the sample connections is transferable as indicated by the wipe test. The highest wipe count found at the sample point was recorded to be 2565 alpha c/m. Protective equipment in the form of gloves are worn during sampling and product removal operations. Sampling and product take off locales are not restricted to visitors. Uninformed personnel are subject to contamination unknowingly since these areas are not identified as being contaminated.

K-131 Feed Purification Building

Routine Surveys - (Operating Group):

Six (6) surveys were reported with 148 readings recorded as above tolerance. The maximum reading being 1600 c/m, found on the "D" bath cover. All beta-gamma readings reported were below tolerance as well as recorded air samples.

Spot Surveys - (Radiation Hazards Department):

Contamination in this area, as revealed by three spot surveys, continues to be found on tools, gloves, top portion of baths, and on a ledge at the end of "D" bath. Tools are contaminated with material averaging 2500 alpha c/m. Gloves and surface readings on the bath are generally in the range of 1300 c/m. The hazard presented by this material is lessened since the material cannot be transferred as shown by the wipe test. Protective clothing in the form of coveralls, gloves and assault masks are used during cylinder connecting and disconnecting operations. A Pappy hand counter is now available for hand counting.

K-631 Waste Disposal Room

Routine Surveys - (Operating Group):

Seven (7) surveys reported show 365 readings recorded. The maximum of twenty-eight (28) above tolerance readings was 4500 c/m found on the south Welch pump located in the Shipping Room. All air samples recorded were below tolerance.





Spot Surveys - (Radiation Hazards Department):

The finding of three surveys conducted in the shipping room of the waste disposal building revealed above tolerance areas in the vicinity of the sample connection, sample holder and on the floor directly beneath the sample point. The affected area was approximately one square foot. No transferable material was present as indicated by the wipe test. A survey made on April 22nd indicated contamination found at the sample withdrawal locale had been decontaminated to below tolerance, but above tolerance readings were found on #1 and #3 cylinder rack. In general, contamination found in this room is spotty and located near sampling and product withdrawal connections. Operators continue to use coveralls, gloves and gas masks when sampling and connecting cylinders. (See hand count section.)

K-300 Coded Chemical Vaults

Vault IX

Routine Surveys - (Operating Group):

One reported survey was made of the wault floor during April, all readings were below tolerance.

Vault 8A

Routine Surveys = (Operating Group):

One survey was reported during the month of April. All above tolerance areas were found on the floor, the maximum recorded reading being 2704 alpha c/m.

Vault 15A

Routine Surveys = (Operating Group):

One survey was reported during the month of April. No above tolerance conditions were found.

Spot Surveys - (Radiation Hazards Department):

Contaminated solutions and carbons are stored within this vault. Only one above tolerance reading was found on the top of a bucket filled with contaminated solution. 324 c/m of this material was transferable as shown by the wipe test. Operators wear gloves and coveralls when handling containers in the vaults. Masks are used during sampling and transferring of solutions and contaminated carbon.

Vault 16A

Routine Surveys = (Operating Group):

Three (3) surveys were reported during the month of April. Of the one hundred thirty (130) readings recorded as above tolerance, all were found on the vault floor, the highest being 62,926 alpha c/m. Above tolerance areas were being decontaminated at the conclusion of routine surveys.



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Spot Surveys - (Radiation Hazards Department):

Two (2) surveys conducted during the month show considerable improvement in the general condition of this vault. Above tolerance readings revealed by a subsequent survey indicated considerable smaller area than that found during an earlier survey. A leaking contaminated solution container was responsible for a contamination of 39,000 alpha c/m, in a square foot area on the floor. It was possible to transfer greater than 39,000 alpha c/m of this material. A scale situated on a sample table revealed a count of 5,000 c/m. Drums were also contaminated, in some cases as high as 5900 c/m. The operating group have been surveying the vault and following these surveys with decontamination operations. Personnel working in this area wear rubber shoe covers in addition to coveralls and gloves. Hand counting of personnel upon leaving this area will be started in the near future. The situation here is improved over last month.

Vault 17A

Routine Surveys - (Operating Group):

Two (2) reported surveys revealed three above tolerance locales. A maximum of 2117 alpha c/m was recorded as floor contamination.

Spot Surveys - (Radiation Hazards Department):

Extensive decontamination by the operating group has reduced contamination to only isolated spots. Floor contamination indicated by previous surveys to be as high as 50% of the floor area, has been reduced to an area of approximately three square feet. A hand counting program will be started in the near future.

Area I Cascade Buildings - K-402-1 through K-402-9

Routine Surveys - (Operating Group):

Five (5) reported surveys revealed no above tolerance surface contamination. The maximum reading of 101 readings recorded, was 410 alpha c/m found on a mobile unit located in K-402-4 building.

Spot Surveys - (Radiation Hazards Department):

One (1) survey revealed no above tolerance readings within the line recorder station area. Monthly inventory samples are responsible for the majority of contamination. Decontamination is effected at the completion of the sample withdrawing operations. Three above tolerance readings were found in the area of the K-402-4 feed filter. No transferable material was present.

Area II Cascade Buildings - K-311-1 through K-301-5

Routine Surveys = (Operating Group):

Twenty-eight (28) monitored locations were reported with eight above tolerance counts found. Highest count being 5760 c/m on cell floor beneath a C-216 evacuation valve in building K-310-3. All locations with high counts were later decontaminated

Spot Surveys - (Radiation Hazards Department):

Approximately fifty (50) locations were monitored on line recorder station floors and equipment with no above tolerance conditions found.

Two (2) above tolerance counts were found in K-311-1 laboratory. Highest being 2,000 c/m on floor covering an area of about one foot square.

The feed cylinders in former feed room, K-309-1, cell floor, have been disposed of, leaving no alpha emitting material in the room.

Area III Cascade Buildings - K-302-1 through K-303-10

Routine Surveys - (Operating Group):

Four (4) surveys were made during the month covering line recorder stations, pipe galleries, cell floors and hand rails. Only three above tolerance readings were recorded as follows: K-303-9 line recorder station, 8900 c/m; K-302-4, Cell 6, cell floor, G-74 purge gas connection, 330 c/m; K-303-7 line recorder station 1700 c/m. Hand rails and pipe galleries revealed no above tolerance conditions.

Spot Surveys - (Radiation Hazards Department);

A total of fifty-five (55) locations were checked with only two (2) above tolerance counts noted; highest being 7788 c/m located on pit wall of purge and product room, K-302-5. This material is visible. On about one foot square area, 3894 c/m was found outside north door of cold trap room in K-302-5. 375 c/m of this material was transferable.

Area IV Cascade Buildings - K-304-1 through K-305-11

Routine Surveys - (Operating Group):

One (1) reported survey revealed six (6) above tolerance areas in the line recorder stations. A maximum reading of 1950C c/m was taken on the floor of the K=30.5=2 station.

Ten (10) surveys were conducted in the basement and cell floor. Seventy-four (74) above tolerance readings were recorded. The majority of the above tolerance areas were found near Allis-Chalmers pumps after seal changing operations. Above tolerance locales are decontaminated at the conclusion of each survey.

Spot Surveys - (Radiation Hazards Department):

Two above tolerance contaminated spots were found in the vicinity of the K-305-2 vent duct in an area of approximately one square foot. A maximum count of 5600 c/m showed a possible transfer of 128 c/m of this material. A small spot located on the floor in the K-305-4 line recorder station valve manifold housing indicated an activity of 71,000 c/m. No transferable material was present.

Area V Cascade Buildings - K-305-12 through K-312-3

Routine Surveys = (Operating Group):

Eight (8) reported surveys revealed one hundred sixteen (116) above tolerance



small areas on line recorder manifold sample connections and floors. Above tolerance areas are decontaminated at the conclusion of each survey. A total of six air samples were taken in the line recorder stations. All were below tolerance. The maximum air activity of 1.73 c/m/ft³ was found in the K=306=1 line recorder station.

Spot Surveys - (Radiation Hazards Department):

One (1) survey conducted in the line recorder stations continues to show that the majority of contamination in this area is found at the sample connection. Isolated spots were reported above tolerance near the valve manifold housing in buildings K-305-12 and K-306-2. The contamination in the K-305-12 station was the only transferable material contamination as shown by the wipe test.

K-305-12 Product Cylinder Head Repair Shop

Routine Surveys - (Operating Group):

Daily surveys are conducted in this shop. A total of two hundred thirty two (232) above tolerance readings were recorded. A maximum activity of 22,000 c/m was found on a drainboard located over a water bath. 2300 c/m of this material was transferable as shown by the wipe test. Four air samples taken were below tolerance. Above tolerance areas are decontaminated at the conclusion of each survey. (See hand counting section).

Spot Surveys - (Radiation Hazards Department):

The results of three surveys conducted in this area show the presence of transferable alpha contamination. The majority of contamination is found on work benches, gloves and a rack used for storing of product cylinder valve bellows. Easily decontaminated surfaces have been provided on work benches. Decontaminating operations, as a rule, are accomplished daily. Gloves are used during the handling of contaminated equipment.

K-306-6 Product Cylinder Assembly Shop

Routine Surveys - (Operating Group):

Surveys are conducted daily in this shop. Two hundred (200) above tolerance readings were reported. The majority of the above tolerance contamination was found on shipping cans, product cylinders, gloves and a work bench. Activity as high as 7,800 alpha c/m was found on product cylinders. Two air samples were below tolerance. Above tolerance areas are decontaminated at the conclusion of each survey. (See hand counting section.)

Spot Surveys - (Radiation Hazards Department):

Contaminated cylinders continue to be responsible for surface and wipe contamination found on gloves, cylinder buggys and work benches. Three surveys conducted in this area revealed above tolerance surface contamination during two surveys. A third survey found the location to be free of alpha contamination with the exception of a product cylinder. Coveralls and gloves continue to be used during cylinder assembling operations.

K_306_7 Product Withdrawal Area

Routine Surveys - (Operating Group):

Daily surface alpha surveys are conducted in this area. Above tolerance surface activity was found on the cylinder defroster, inside of dry boxes, floor and gloves worn by operators. This area is decontaminated daily. Daily six hour duration air samples are taken in the product withdrawal room. None were reported above tolerance. However, an air activity of 11.51 c/m/ft³ was reported for a thirty minute period following material release occurring on April 21. (See Material Release Section).

Spot Surveys - (Radiation Hazards Department):

Above tolerance readings were found during three surveys conducted in this locale. In addition to contamination resulting from normal operations, floor contamination was found as a result of maintenance operations during equipment repair. Floor contamination of 17,000 c/m was found beneath a face bath. The spilling of contaminated decontamination solution was responsible for a reading greater than 30,000 c/m at the product withdrawal area entrance. Surface contamination is removed by decontaminating operations when found by routine surveys. This is borne out by spot checks.

K-312 Basement

Routine Surveys - (Operating Group):

Four (4) surveys conducted in this area revealed one hundred seventy-eight (178) above tolerance spots. The major portion of this contamination was found around Valley Iron Works pumps of cells 7 and 9 in the K-312-1 building. This contamination was the result of carbon seal changing maintenance operations. Above tolerance areas were decontaminated at the conclusion of each survey.

Spot Surveys - (Radiation Hazards Department):

The majority of the contamination found in this area is caused by the K-312-1 carbon seals as previously reported. A wooden work table located in the K-312-3 building was again found contaminated with counts as high as 13,000 c/m and transferable material of 2,300 c/m as shown by the wipe test.

K-306-1 Ement Portal

Routine Surveys - (Operating Group):

Two (2) surveys of trash cans located in this portal revealed above tolerance contaminated articles. Above tolerance trash was segregated and sent to the contaminated trash burning incinerator for disposal.

Spot Surveys - (Radiation Hazards Department):

Spot survey conducted April 19th confirmed the findings of contaminated trash in waste cans as reported by the operating group.

K-300 and K-400 Process Area Instrument Shops

K-301-4 Line Recorder Shop

Routine Surveys - (Operating Group):

One (1) survey reported one reading of 420 alpha c/m on a three wheel bicycle used in moving equipment. This was reported decontaminated.

Spot Surveys - (Radiation Hazards Department):

A spot survey conducted April 6th revealed one (1) above tolerance reading of 3244 alpha c/m found on line recorder sampling manifold parts. It was possible to transfer 840 alpha c/m as shown by the wipe test. The sample manifold parts were reported just returned from decontamination. According to supervision, these parts will be decontaminated once again and placed in salvage.

K-303-7 Line Recorder Shop

Routine Surveys - (Operating Group):

No reported surveys.

Spot Surveys - (Radiation Hazards Department):

A Spot survey on April 6th disclosed two (2) above tolerance locales. A count of 8110 alpha c/m was found in a two square foot area on the floor beneath a work bench having a possible transfer of 2520 alpha c/m of material. A count of 2520 alpha c/m was found in a four square foot area with a possible transfer of 168 alpha c/m. These above tolerance areas can be attributed to a recent material release. Decontamination of this area was indicated.

K-305-9 Line Recorder Shop

Routine Surveys = (Operating Group):

Four (4) surveys reported six (6) above tolerance readings, the maximum count recorded being 11,880 alpha c/m located on a paper lying on the floor. paper was contaminated by small vacuum pumps placed on here waiting to be picked up by the decontamination squad. Above tolerance locales are decontaminated at the conclusion of surveys.

Spot Surveys - (Radiation Hazards Department):

A survey conducted on April 6th disclosed no above tolerance conditions; contamination found here on previous surveys having been decontaminated.

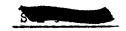
K-402-9 Line Recorder Shop

Routine Surveys = (Operating Group):

No reported surveys.

Spot Surveys - (Radiation Hazards Department):

All readings taken on a survey April 6th were below tolerance.



K-305-10 Pneumatic Instrument Shop

Routine Surveys - (Operating Group):

No reported surveys.

Spot Surveys - (Radiation Hazards Department):

Only one above tolerance area was found in this locale. This material was found on the surface of a salvage box. 168 alpha c/m of material was transferable as shown by the wipe test. Supervision was notified.

K-300 and K-400 Process Maintenance Shops

Routine Surveys = (Operating Group):

Twenty-eight (28) above tolerance readings were recorded during two (2) surveys conducted in the K-305-12 shop. The majority of the above tolerance locales were found on seal pans. The seal pans were decontaminated at the conclusion of each survey.

Spot Surveys - (Radiation Hazards Department):

A total of eight (8) shops surveyed revealed above tolerance areas in all with the exception of the K-310-1 and K-302-1 shops. The majority of above tolerance readings as high as 4800 alpha c/m are found on equipment removed from operation and on Maintenance seal pans used in preventing the contamination of process equipment during seal changing operations. Floor contamination in small areas were found in the K-301-1 and K-305-12 shops. A work bench located in the K-312-2 Valley Iron Works pump shop had transferable material as high as 336 alpha c/m. Supervision was notified at the conclusion of each survey of the above tolerance locales. In general, decontamination crews were called in to remove the above tolerance material. (See hand counting section.)

K-300 and K-400 Area Process Maintenance Vehicles

Routine Surveys - (Operating Group):

Surveys were reported on twenty (20) Maintenance vehicles such as trucks, Clarkats, Hy-Lifts, etc. These surveys ranged from one to four surveys on each vehicle. Only five (5) vehicles had recorded above tolerance readings. The highest being on the bed of vehicle #A.E.-1652 which was 26,389 alpha c/m with a possible transfer of 5997 alpha c/m. All vehicles with above tolerance counts are decontaminated. These vehicles are used to carry contaminated process equipment.

K-300 and K-400 Process Maintenance Jobs

Routine Surveys - (Operating Group):

Approximately eighty (80) monitoring surveys involving pump, seal, converter, Valley Iron Works seals and valve replacements, were reported during the month of April. Above tolerance surface alpha counts were recorded on the majority of jobs. A count of 63,500 alpha c/m was recorded at K-312-1, Cell 7, #1 Valley Iron Works pump base after a carbon seal replacement. A count of 2062 alpha c/m was recorded on a socket wrench used during a seal replacement at K-312-1, Cell 7. A 10,160 alpha c/m was reported on the floor in the vicinity of 1B pump at



K-402-8, Cell 8, after a pump seal had been replaced. A 3338 alpha c/m reading was recorded on a seal puller used during 2B pump seal replacement at K-302-3, Cell 8. A reading of 31,288 alpha c/m was reported on floor at K-305-12, Cell 9, after 3B seal was replaced. A high reading of 9715 alpha c/m was recorded on floor under #4 converter spool at K-302-5, Cell 9. A reading of 5139 alpha c/m was recorded on floor at #6 converter in K-302-4, Cell 8, with a possible transfer of 2203 alpha c/m.

Spot Surveys - (Radiation Hazards Department):

Audit of seven (7) Mechanical Maintenance jobs show high air activity during preliminary dismantling operations and during the removal of the damaged seals. Floor surface contamination as a general rule was found to be below tolerance at the conclusion of seal change work. However, high readings are found on tools, gloves and coveralls worn by the Maintenance personnel. A carbon seal change in the K-312-1 building revealed exceptionally high air activity. Airborn contamination as high as 91,511.0 c/m/ft³ was reported. Surface contamination during this job was prevalent over an area of approximately 100 square feet. The high level of contamination was caused by contaminated carbon dust from the carbon seal removed. Assault mask respiratory protection was used by Maintenance personnel during the period of high air activity reported above.

Hand, foot and clothing checks are taken and recorded by the Operating Group at the conclusion of each jeb.

K-1004 Laboratories A, B, C and D

Sampling Section (Rooms 19-A, 20-A, 215-C, Outdoor Storage Cages.)

Routine Surveys - (Operating Group):

As had been anticipated, the results of the stainless steel table tops installed near the end of last month were immediately evident. Contamination levels this month were less than half of those reported last month. The average of the maximum readings from each survey was 1500 c/m compared to a 2000 c/m average of all readings last month. The highest individual reading of 9000 c/m shows no appreciable improvement over a high of 10,500 c/m last month, but contrasted against the overall picture, this serves only to point out more strongly the necessity for frequent checks and decontaminations. In both instances, the high readings were the result of fresh spillage which was immediately removed.

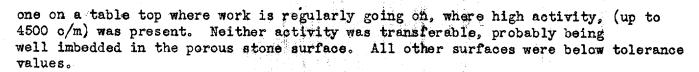
Spot Surveys - (Radiation Hazards Department):

The only above tolerance readings found in two surveys this month were three relatively small areas on the floors, none of which showed any transferable activity. The highest of these was 1728 c/m. Airborne activity was at background level and beta activity was not found to be above one fiftieth of tolerance value. Gamma activity above background was not present.

Radiation Section

Routine Surveys - (Operating Group): Rooms 18-A, 23-A.

Two (2) routine alpha surface surveys located two points, one in a hood and



Spot Surveys - (Radiation Hazards Department):

Two spot surveys made in the rooms, occupied by this section, reported the above locations, as well as a spot on the floor in front of a hood where activity up to 6955 c/m was found. Again negative wipe tests indicated that the activity was deeply imbedded. No airborne activity was present. Beta and gamma radiation was at background level with the exception of a small area within a ten-inch radius of a container which had been inadvertantly left out of its lead shielding. This was simply corrected.

Uranium Analysis Section (Rooms 101-B, 105-B, 111-B, 115-B, 117-B)

Routine Surveys - (Operating Group):

Nine (9) routine surveys made during the month indicated a fairly constant average contamination level, with individual high readings arising at different sources, indicating regular decontamination, combined with equally regular recontamination. General averages however, appeared to be lower than those reported last month. The relocation and re-design of several hoods to permit better grouping of offending operations is probably partially responsible for the improvement. This minimizes the spread of contamination, as well as simplifying decontamination. In addition, several surfaces were coated, during the month with phenolic resin, making them easy to decontaminate, as well as lessening their ability to pick up active materials, by eliminating all porosity. In general, however, all decontamination was good, no point remained consistantly high throughout the month.

Periodic surveys made on the grinders in Room 170 showed some residual activity on isolated surfaces. No further attempts at decontamination were made.

Spot Surveys - (Radiation Hazards Department):

Two (2) spot surveys, made on the fourteenth and twenty-eighth found no areas of contamination other than those reported by the operating groups. Maximum activity of 2100 c/m was in close agreement with that found in routine surveys. No airborne activity above background level was detected.

Counting Section (Rooms 104-B, 108-B, 114-B, 116-B, 119 & 121-B, 122-B.)

Routine Surveys - (Operating Group):

The results of nine (9) routine surveys made during the month showed a generally improving activity level as the month progressed. Rooms 114-B, 116-B, and the 119-121-B offices were reported free of any contamination throughout the entire month. The gravimetric, plating, and special projects laboratories maintained activity levels approximately equal to last months, though a high spot of 22,500 counts found in a hood in the gravimetric laboratories exceeded any previous maximum readings in this section. This spot along with others reported during the month was successfully decontaminated to make the final survey on the thirtieth lower than any survey from this section to date. An extensive program of decontamination and phenolic resin surface coating in Room 122-B was carried on during the month, bringing its activity average steadily lower as each successive survey



was made. This type of surface coating should make daily decontamination possible, and the results for May should gage the success of this program.

Spot Surveys - (Radiation Hazards Department):

Two (2) spot surveys in these locations followed the routine survey results closely. Two points not reported in routine surveys were located, one a sink apron in room 108 showed activity up to 9960 c/m. Other indications are good; air samples showed no above background airborne activity, floors were clear of surface activity and no active surfaces held transferable material.

Metallurgy Section - Rooms 2-D and 23-D.

Routine Surveys - (Operating Group):

Two (2) surveys made during the month reported all but one room of this section to be free of above tolerance alpha activity. Several spots on the floor of room 2-D were located. These showed readings up to 1600 c/m, while a nearby hood had activity up to 39,000 c/m of which 1470 c/m were transferable.

This situation was immediately rectified by a series of decontaminations, followed by several coats of paint. All other areas in this room were below tolerance.

Spot Surveys - (Radiation Hazards Department):

An investigation of this location confirmed the localization of contamination in and around the hood in question. No other activity was found. Ample evidence of the efforts to control the problem was observed but complete reduction to below tolerance levels had not been achieved by the end of the month, though this goal is expected to be reached during May.

<u>Spectrometer Section</u> - Rooms 59-A, 63-A, 215-C, 217-C, 207-C, 211-C, 274-C, 213-C, 209-C.

Routine Surveys - (Operating Group):

Six (6) surveys made in this section during the month showed an activity level which gave room for considerable affort both to prevent the deposition of active material and to speed up the detection and removal of deposits when formed. The high readings of 16,500 c/m located in room 274 on the seventh increased to 22,500 c/m by the fourteenth. During the following week new tops were installed on this and two other work benches in this room as part of the general campaign to lessen activity hazards. Subsequent surveys found this room completely below tolerance. Other rooms had active areas up to 12,000 c/m but in each instance it was possible to decontaminate completely. New points developed regularly however, and only rooms 209, 213, and 217 were found completely free of contamination. Other areas were in the main, however fairly free of active material, and no air contamination was found.

<u>Spot Surveys - (Radiation Hazards Department):</u>

One (1) Health Physics inspection confirmed the routine survey finding as reported above. Few wipe test results were positive, attesting to good contamination frequency. Advisability of additional table top replacement, with stainless steel where possible, was noted, but the program toward complete contamination control does show considerable progress.





Spectrometer Standards Section (Rooms 206-C, 210-C, 214-C, 219-C, 220-C.)

Routine Surveys - (Operating Group):

Four routine surveys made in this section showed six points of above tolerance activity. Wipe results were low, showing up to 625 c/m at only four points. The highest surface reading was 1700 c/m. A general decontamination on the twenty-second brought all installations of the entire section well below tolerance values, with the single exception of one end of a bench top in room 219. All transferable activity was removed. The work bench top in question, which reads up to 24,000 c/m will have to be covered or removed to eliminate the activity now present.



Analytical Research Section - Rooms 04-D, 17-D, 19-D, 8-D.

Routine Surveys (Operating Group):

Of five surveys in this section during the month, fairly widespread low level contamination appeared at first. An average of 2000 c/m with a maximum count at one point on an electrode rack of 9000 c/m was reported. A general decontamination brought most of these points to below tolerance by the end of the month. Transferrable activity, which had been as high as 1890 c/m at one place early in the month, was removed almost completely, two ring stands and one small point on a bench top, with a maximum of 500 c/m, being the only points which gave positive wipe test results in the final survey of the month. Surface contamination was reduced proportionally only three above tolerance points appearing. In three checks, no airborne activity was reported.

Molecular Spectroscopy Section - Rooms 05-D, 212-C.

Routine Surveys (Operating Group):

One routine survey early in the month covered this location very thoroughly and found no activity deposits reading over 100 c/m.

Spot Surveys (Radiation Hazards Dept.):

A Health Physics inspection of this location made later in the month confirmed the fact that no contamination hazards are present.

Physical Chemistry Section - Rooms 05-D, 09-D, 21-D.

Routine Surveys (Operating Group):

resent in several work locations. The contamination was not widely spread and several decontamination brought it down to tolerance level. Readings in several surveys after decontamination showed activity reductions in all generalized locations, and the usual tendency toward localized recontamination. Counts on the floor up to 12,000 c/m were removed with the exception of one point which remained at 1100 c/m, three hundred counts above tolerance. One local high spot appeared on a hot plate in the last survey of the month, at 37,500 c/m. Work surfaces inside hoods remained above tolerance, fluctuating from one survey to the next but following a pattern which indicates fairly effective control, though one hood surface reached 13,500 c/m on the nineteenth. Regular air samples showed no airborne activity above anticipated background.

Spot Surveys (Radiation Hazards Department):

One Health Physics inspection on the twentieth found no points worthy of special note. Activity in hoods up to 7300 c/m confirms the routine observations and points to the need for better control of contamination source, as well as frequency and effectiveness of decontamination. Other work surfaces were fairly free of activity, but constant surveillance will be necessary to keep the activity levels under control. Local spillage or spattering seems to account for most of the observed activity, as confirmed by the low counts on floors and other surfaces away from immediate working areas.



Special Analysis Section - Rooms Oll-D, Oll-A-D, 11-D, 11-A-D.

Routine Surveys (Operating Group):

Three surveys made in this section found activity fairly constant, and no apparent improvement followed decontamination. Activity levels were not excessively high, but were well above tolerance for many working areas, with outstanding high points, such as 24,000 c/m on a hood floor, 1800 c/m on a table top, 1200 c/m on a vacuum rack, all in Room 11. The chief effect of decontamination appeared in wipe test results. Transferrable activity, which had been fairly widespread at the start of the month had virtually disappeared by the last survey, which was made on the twenty-seventh (27th). The other rooms of this section were free of contamination.

Spot Surveys (Radiation Hazards Department):

A Health Physics check attempted to determine the reason for the apparent ineffectiveness of decontamination in Room 11. Contamination possibilities seem no greater than those in other areas, nor were activity levels higher or in any way unusual. It was determined that stronger decontamination solutions would be tried, and should they be unsuccessful, the application of stainless or plastic surface would be necessary.

Conditioning Section - Rooms 19, 21, 25, 28, 30, 32, 34, 36, 38 and Store Room.

Routine Surveys (Operating Group):

Five routine surveys made in the rooms of this section during the month showed generally decreasing activity. A survey on the seventh showed above tolerance points in six of eight rooms, while the last survey of the month found seven of the eight rooms free of any above tolerance activity. The eighth had a maximum reading of 2000 c/m on one table top. Much of this improvement can be attributed to an extensive program of surface coating which was carried out during April. A phenolic resin coating was applied to a number of table tops, hood surfaces and sink drainboards. There were found to be completely effective both in sealing off previously absorbed active material on rough and porous surfaces and in simplifying removal of activity accumulated after the coating was applied. Use of the coating was found to be wholly satisfactory not only from the standpoint of alpha contamination, but from those of appearance, stain-resistance and general utility. Decontamination is now quick and effective. Only the wearing qualities of the surfacing remain to be demonstrated.

Spot Surveys (Radiation Hazards Department):

Two spot surveys made during the month offered further proof of the value of the surface coating. The first made on the eighth, found readings up to ²³⁶⁰ c/m, with no accompanying transferable activity, while the second survey, made on the twenty-ninth, found no activity, either surface bonded or transferable, even showing that the few points reported in the last routine survey of the month made one day earlier, had been removed.

Airborne activity was reported at background in all rooms for both surveys.





Barrier Research Section - Lab. X and Associated Office.

Routine Surveys (Operating Group):

Four surveys made in this location found only two points where above tolerance activity appeared. In general, the working areas were free of contamination, and no transferable activity above tolerance was found at the end of the month. Decontamination had brought the two above mentioned points from a maximum of 10,500 c/m to 1000 c/m and no obstacle to their total removal in subsequent decontaminations appear to exist.

Spot Surveys (Radiation Hazards Department):

A Health Physics inspection at the end of the month confirmed the findings of the routine operating groups reports. A leaking sink drain, which may have contributed to one of the contamination areas noted was being repaired. The existance of a transite table top was noted as a point apt to be succeptable to future contamination but it checked below tolerance at this time.

Critical Mass Section - Building K-1095.

Routine Surveys (Operating Group):

One set of air samples was taken to check the operating conditions of the newly designed reactor replacing the one found to be potentially hazardous last month. All samples were below tolerance with the exception of two taken close to the reactor at points not readily accessable to personnel. This condition did not affect general airborne activity level throughout the room, but it is felt that a few minor changes will remove all possibility of released airborne contamination.

Radio Chemical Laboratory (Tracer Operation)

The principal activity was to review the existing situation and to make comments on the existing safety regulations then in effect. These included recommendations that signs be posted to make public all mandate y restrictions, that puncture wounds be treated differently than originally suggested, and that more consideration be given to roped-off areas where high radiation levels may exist.

Several projects were outlined in connection with this work. They include the specifications for tolerance levels of various active materials, the design of suitable forms for random monitoring, and the establishment of a system for routine monitoring.

Electrochemical Section

Routine Surveys (Operating Group,

Four (4) surveys of the room and its equipment were made by the operating group. No above tolerance counts were found.



Special Projects Section - Room 123-B (Tracer Laboratory).

Spot Surveys (Radiation Hazards Department):

Two (2) surveys for alpha were made during the month. The work benches, hood, table, and chairs were all below tolerance. One spot on the floor had an alpha count of 1000, not transferable. This reading is lower than the 1200 count last reported by the operating group. Two (2) air samples were well below tolerance.

Wet Chemistry Section - Room 20-D (Handling and Preparation of Samples for Research Operations at Tracer Level).

Routine Surveys (Operating Group):

- One (1) above tolerance alpha counts of 1000 and two (2) high readings (700 c/m) were found during four routine surveys. These readings were found on filter equipment on the work bench. No counts were transferable at any of these points. Office equipment was in its usual state of cleanliness. No air samples were taken.
- One (1) non-routine survey was made on the garbage can containing laboratory waste. One-tenth roentgen was found at 6". The can was transferred for disposal.

K-1024 Instrument Building

Electronic Development Shop (Rooms 1, 2, 3 and 8)

Routine Surveys (Operating Group):

Two (2) surveys conducted this month did not locate any detectable alpha, activity.

Spot Surveys (Radiation Hazards Department):

One spot survey and checking air sample confirmed the general cleanliness of this shop.

Electronic Instrument Shop

Spot Surveys (Radiation Hazards Department):

One (1) spot survey conducted this month located only two (2) small above tolerance areas, the highest being 8,500 c/m on one work bench where contamination is anticipated. This bench is periodically decontaminated. The hand counting program is being continued.

Pneumatic Instrument Shop

Spot Surveys (Radiation Hazards Department):

One area of one square foot was found with slightly above tolerance alpha activity of 1100 c/m. This activity was on the table used for instrument interior decontamination, where rubber gloves are normally worn, and was promptly decontaminated. One checking air sample was below tolerance.





K-1301 C-216 Generation and Oxide Conversion Building

Routine Surveys (Operating Group):

Six (6) surveys show a number of above telerance areas. A high reading of 2800 c/m was found on "B" reactor. All beta-gamma readings reported were below telerance as well as all air samples. All hand counts recorded were below telerance.

Spot Surveys (Radiation Hazards):

Above tolerance surface contamination continues to be found in the hallway between the oxide grinding and weighing rooms and the oxide conversion room. Tracking of material from the grinding room into the hallway is responsible for this contamination. Contamination within the grinding room is in the form of a coat of oxide dust on all surfaces. Assault masks, coveralls, head covers, gloves and special shoes are worn by personnel working in this room.

K-1303 Decontamination Building

Routine Surveys (Operating Group):

Six (6) surveys reported a total of 840 readings. The highest of 300 above tolerance readings was 30,000 c/m, found around the L decontamination tank. Transferable material as high as 6559 alpha c/m was present as shown by the wipe test. All beta-gamma readings reported were below tolerance as well as air samples. (See Hand Count Section.)

Spot Surveys (Radiation Hazards):

All decontaminating equipment has been removed from this building and the floor surface decontaminated to below tolerance level for the installation of new converter decontaminating equipment to be installed.

K-1401 Building (Maintenance Shops)

Scrap Enclosure, Cleaning Area, and Safety Equipment Shop

Routine Surveys (Operating Group):

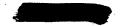
The practice of monitoring all safety equipment is being continued. Items which cannot be successfully decontaminated are not issued.

Parts in the scrap enclosure which are suspected of being contaminated are checked for alpha activity. Approximately 100 valve parts were found contaminated up to 5000 c/m. The parts are either sent to the contaminated scrap yard, or to the decontamination section for cleaning before being repaired for re-use. Leather gloves are worn when handling this material.

Spot Surveys (Radiation Hazards Department):

A spot survey of the scrap enclosure confirmed the results of the operating group.





In the cleaning area, one spot survey located one contaminated vacuum pump part with 3,900 c/m. This will be decontaminated.

The general condition of the above mentioned locations is good. Alpha activity is neither widespread nor is it very high. Alpha shecks are made by supervision on all suspected equipment.

Vacuum Pump Shop

Routine Surveys (Operating Group):

Daily alpha surveys continue to indicate that contaminated equipment is being serviced. Pump parts have been found with activity up to 52,000 c/m with up to 26,000 c/m transferable. Work surfaces on which such equipment is handled are frequently alpha active, the highest recorded this month being 38,000 c/m on a table top.

This condition is known and understood by supervision and also by the men. Protective equipment is worn when working on contaminated equipment preparatory to decontamination, and hand counts are taken whenever necessary, but at least twice daily. Frequent decontamination is rejorted to, to prevent the build-up of uranium material.

Spot Surveys (Radiation Hazards Department):

Two (2) spot surveys this month confirmed the conditions reported above. Two (2) air samples taken during disassembly of two contaminated vacuum pumps were well below tolerance, indicating that the oily surfaces tend to keep alpha emitting uranium material out of the air.

The isolated pump disassembly and decontamination room mentioned in previous monthly reports is still in the planning stage.

Valve Shop

Spot Surveys (Radiation Hazards Department):

Four (4) contaminated valve parts were found with activity up to 39,000 c/m. A Victoreen 356 Alpha Meter was obtained for use by the Valve Shop for monitoring valves before working on them. A hand counting program was started late in the month.

AC Pump and Seal Shop

Routine Surveys (Operating Group):

Daily alpha monitoring disclosed no above tolerance activity on work surfaces. Hand counts are taken in this shop.

Spot Surveys (Radiation Hazards Department):

Readings taken this month on two spot surveys confirmed the results of the operating group. The only above tolerance readings found were on the stored contaminated equipment discussed in the previous monthly reports.





K-1405 - Chemical Engineering Building

Routine Surveys (Operating Group):

No surveys reported.

Spot Surveys (Radiation Hazards Department):

A study of the K-1405 Chemical Engineering Development building revealed the existance of an oxide fluorination experimental set up that was responsible for spread of radioactive material throughout the enclosed room. Protective equipment was worn by personnel and signs warned those who enter that a hazardous operation existed. Surface alpha contamination was found on protective clothing hanging on a clothes rack which also held personal clothing. Work shoe lying beneath this rack had contamination on the soles. Gloves were also found to have above tolerance contamination. No regular schedule exists for changing of coveralls or gloves. A change house will be set up in the K-1407 Building. Separate lockers provided for street and protective clothing. Personnel monitoring will be accomplished upon leaving the change house.

K-1410 - Carbon and Alumina Separation

Spot Surveys (Radiation Hazards Department):

A survey conducted April 6, 1948 disclosed a high level of alpha surface activity caused by carbon sampling and separation operations. A maximum count of 8110 alpha c/m was found on floor in vicinity of contaminated carbon sampler having a possible transfer of 3244 alpha c/m. Hand checks of operators who were moving drums in building revealed counts as high as 256 appha c/m. Upon completion of the survey, a check on shoes worn by the surveyor showed contamination on the sole as high as 2352 c/m.



IV. PERSONNEL MONITORING

Hand Counts

K-306-7 Product Withdrawal Area

Hand counts of operators working in this area are taken before lunch and at the end of each shift. Maintenance personnel engaged in maintenance work within this area are also checked upon leaving. Facilities for wathing hands are available at this location. Hands are washed thoroughly before a check is made. Only one instance was recorded of a hand count above tolerance. Further washing reduced the activity to below tolerance.

In addition to monitoring of personnel working in this area, persons engaged in cylinder head repair and assembly operations are also monitored with this Alpha Poppy Counter.

K-305-9 Change House

Hand check of persons leaving the RR Area continue to be taken. Approximately 1,766 persons were so monitored this month. Three (3) above tolerance cases of hand contamination were revealed. However, further washing succeeded in reducing contamination to below tolerance.

K-1004 Laboratories

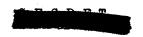
Hand counting was continued on the same basis at last month. Formal hand counting reported on Standard forms was instituted in the Critical Mass Section this month and additional expansion of the program is planned in Laboratory D.

Hand counting in the laboratories was carried out this month, and formally reported, according to the following schedule:

Section	Number of Employees Counted	Type of Count	Frequency
Sampling	12	Alpha	Twice/shift
Uranium Analysis	19	Ü	'n
Counting	21	11	Ħ
Electronics	5	11	n
Spectrometer	53	u	ii
Critical Mass	10	ri,	Ü

In addition thirty-five (35) employees of the Metallurgy and Physical Chemistry Sections regularly use an A.C. Poppy hand counter as conditions warrant, though no regular reports have been made to date.

Thus 120 regularly reported and thirty-five (35) unreported employees are covered by the hand count program, making a total of 155.





This month eight (8) above tolerance hand counts from the above locations were reported, but in each instance a single reliash brought the count to below tolerance before the employee left his working area. One notable exception appeared in the Critical Mass Laboratory where active material carried in a nitric acid solution was spilled on an employees hands. This produced a count of 250 c/m which could not be removed from the nitric acid stained areas of the hands. Gloves which are normally required for operations of this type were not being worn at the time. No action was taken, and at the start of the following shift the count had disappeared.

Radio-Chemical Laboratory

Section	Number of Employees Counted	Type of Count	Frequency
Tracer Lab.	8	Alpha	Twice/shift
Counting	3	Beta	

No above tolerance readings were reported.

K-1024 Blectronic Shop

Hand counts taken twice each day of all persons who might come in contact with uranium contamination have revealed no above tolerance activity.

K-1300 Area Change House

Fourteen (14) persons working in the Kal301 and K-1303 Buildings are hand checked before lunch and at the end of each shift. No final above tolerance counts were recorded.

K-140 AC Pump and Seal Shop

Twice daily alpha hand counts are taken on the six (6) men who work here. No above tolerance activity was reported.

K-1401 Vacuum Pump Shop

The twenty-seven (27) men working in this shop take alpha activity measurements of their hands before lunch and quitting time every day. In three instances, alpha activity slightly above tolerance was found, which subsequent washing removed.

K-1401 Valve Shop

Because process valves are occasionally found in the shop with above tolerance alpha activity, a hand counting program was initiated this month. No above tolerance hand counts have been reported.





Process Maintenance Jobs

Approximately 110 Maintenance men were reported monitored at the completion of seal and pump jobs. Gloves, coveralls, work shoes, and hands were monitored. Above tolerance readings on gloves were as high as 39,000 alpha c/m. Counts as high as 10,755 alpha c/m were reported on coveralls. Shoe counts ranged from tolerance to as high as 23,446 alpha c/m. A maximum count of 37,122 alpha c/m was recorded on the hands of Maintenance personnel, with a possible transfer of 2886 alpha c/m. Coveralls and gloves are exchanged for clean ones after each job or at the end of each shift. Maintenance personnel are now using rubber shoe covers on these jobs. No final hand counts before lunch and at the end of shift are recorded.

K-1405 Chemical Engineering Building

Hand checks before lunch and at the end of each shift are taken of approximately sixteen (16) persons. No above tolerance final counts were recorded this month.

Film Badges

An average of two hundred seven (207) film badges per week were issued throughout K-25 during the month of April, an increase of thirty-two (32) badges over the month of March. Their use was divided between personnel monitoring and stationary monitoring as follows:

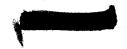
	Stationary	Personnel
Critical Mass Laboratory	6	10
Emergency Monitoring	13	0
Engineering Development	5	0
Health Physics Inspection Section	0	5
Instrument Development Section	0	4
Laboratory Division	4	58
Process Division	43	27
Plant Protection Division	0	30
Maintenance Division	0	2
Total	71	136

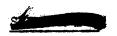
In addition two (2) neutral films were used each week in stationary locations in the Critical Mass Laboratory.

A finger pad program was started during the month with forty-one (41) pads being used throughout the Laboratory Division.

Results

Film badges and pads indicate no above tolerance exposures during the month. During the week of April 16th to April 23rd, finger pads were inadverently exposed to light and therefore no significant records are available for that period.





Sampled during week ending	3-19	3-26	4-2	4-9	4-16	
Location						
Original sample point 6-W K-27 Storm Drain					er e Maria	
into Poplar Creek	0	0	0	1	0	
Drainage from K-131	12 O 12	0	0	24	3	
Drainage from K-631		0	Ö	-	•	* * * * * * * * * * * * * * * * * * *

No correlation between the reported high result of the week of April ninth and either operating conditions or weather could be found.

This high reading does serve, however, in conjunction with the remaining negative results to prove that isolated instances, rather than a permanent condition, account for the previously noted high readings. The sample program at this check point will therefore not be renewed in June and efforts will be bent toward locating and clearing up situations in the K-131 building which might saibly contribute to the reported water contamination.

Sampled during week ending	3-19	3-26	4-2	4-9	4-16	4-23
Location						
Original sample point 14 Influent to Sewage Disposal Plant	0	o	0	0	0	Ó
Upstream of all K-27 area drainage entrances to Sanitary Water System	, 1	0	0	0	0	Ö
Upstream of all K-25 area drainage, on feeder line carrying drainage from Laboratory and Administration Area installations	en e	• • • • • • • • • • • • • • • • • • •	0	o	4	7
Upstream of Stores and Conditioning Area at end of System, Section serving K-1300 area and K-1405 only	-	5	80	17	160	140





V. PROCESS MATERIAL RELEASES

K-101 - C-816 Stripping Building - April 4, 1948

Three persons were sent to the dispensary as a result of a minor release occurring during a product removal operation. The cause of the leak was due to a cylinder gasket melting under excess temperature. A radiation survey revealed a maximum surface contamination of 400 c/m. An airborne sample taken after the release was reported as 0.74 c/m/ft^3 .

K-101 - C-816 Stripping Building - April 11, 1948

During a purge gas sampling operation the sample line was accidentally disconnected, resulting in a material release of 20 second duration. Four persons were sent to the dispensary. All surface readings taken after the release were below tolerance. An air sample indicated an activity of $0.2~\mathrm{c/m/ft^3}$.

K-101 - C-816 Stripping Building - April 14, 1948

During the repinsulation of a reflux line a small quantity of uranium salt was exposed when the old insulation was removed. This material was undoubtedly the result of a material release occurring in the past. An air sample taken in the vicinity revealed an air activity of 232 c/m/ft³. Nineteen (19) persons present in the building at the time the material was found reported to the dispensary. The work area was cleared of personnel until decontamination operations were completed.

K-631 Waste Disposal Building - April 3, 1948

A minor release of material resulted when a small leak developed in a sampling line connection. Since no person was in the near vicinity of the release no one was sent to the dispensary. All surface readings taken after the release were below tolerance. The air activity taken immediately after the release was reported as 0.43 c/m/ft³.

K-301-3 Line Recorder Station - April 19, 1948

A small amount of C-616 material was spilled while maintenance men were removing an old manifold line. The two men present during the release were sent to the dispensary. The highest surface count recorded was 5800 c/m found on the floor. Air sample was reported as 0.23 c/m/ft^3 . After decontamination surface and air counts were below tolerance.

K-302-5, Cell 9 - 4-A Pump - April 7, 1948

A release of ten (10) second duration occurred while maintenance men were removing a process pump. The three men involved were sent to the dispensary. All persons working around the pump were wearing masks. No surface alpha contamination was found. The highest airborne alpha concentration was 1.2 c/m/ft^3 .





K-306-7, SS Area Scale Room - March 23, 1948

A pin hole in a product cylinder was responsible for a five minute release of material in this area. The leak was discovered by an operator who immediately secured an assault mask and placed the cylinder in a can of liquid nitrogen which stopped the leak by solidifying material within the cylinder. Two men were sent to the dispensary as a result of this release. Survey conducted immediately after the release revealed no above tolerance surface contamination. An air sample taken twenty-one (21) minutes after the release gave an air activity of 0.8 c/m/ft³.

K-306-7 Product Withdrawal Room - April 7, 1948

A fifty (50) second release of material occurred at a product cylinder side plug. The leak was stopped by an operator wearing an assault mask. Supervision determined that the possibility of an exposure did not exist, therefore no one was sent to the dispensary. The highest surface alpha activity present after the release occurred was 591 c/m. This locale was decontaminated to below tolerance level.

K-306-7 Product Withdrawal Room - April 21, 1948

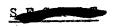
A product cylinder head gasket leak resulted in a possible exposure to two product withdrawal operators. First appearance of the leak was interpreted by the operators to be condensed water vapor from the cold cylinder. A cylinder defrosing operation, however, revealed the vapor to be C-616. A gas mask was immediately donned by an operator and the cylinder placed in the dry box for flash back to the cascade. Highest surface contamination resulting from this spill was 1800 c/m found inside the dry box stand A. An average air activity of 11.52 c/m/ft³ for a thirty minute period was reported existing during and immediately after the release. Above tolerance surface contamination was removed immediately.

K-402-1 Building By-Pass Housing - April 3, 1948

An estimated one minute release occurred when the process system pressure was raised to above atmospheric pressure during a purging operation. Process material within the line escaped through a leak which was to be repaired upon completing the purging operation. Surevision determined that no possibility of an exposure existed, therefore no one was sent to the dispensary. Highest surface reading found during a survey after the release was 734 c/m. An airborne sample taken within the housing was reported to be 471.8 c/m/ft³. Air samples were taken within the housing until below tolerance air activity existed.

K-402-6, Cell 6 - April 9, 1948

A two minute release occurred during an operation involving the transfer of C-616 material from a cylinder to the cascade. The release was caused by a faulty connection. One (1) person reported to the dispensary. The highest surface contamination found at the conclusion of the release was 6,000 c/m. The contaminated area was immediately decontaminated.





K-1401 Converter Shop - April 23, 1948

While removing the head of a converter which was not known to be contaminated, solid uranium material dropped to the floor and contaminated a four square foot area up to 2000 c/m. The area was decontaminated within the hour, and the two men who were in the immediate vicinity were sent to the dispensary.

Contaminated converters are not normally opened in the converter shop without complete safety precautions.

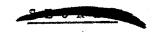
VI. WATER SAMPLE PROGRAM

The water survey program was carried on during April according to the new schedule as reported last month. Again this month an apparent rise in alpha counts of downstream river water occurred. A count of 1.6 / 0.7 alpha counts per minute per 100 milliliters was reported for one day only. No explanation in known K-25 operations could be found. Other samples showed consistant negative results.

The special additional sampling program, adopted in an effort to explain three samples which had previously given positive results was continued during April. In view of the fact that March results at these points were negative, it was decided to allow it to run through the end of May. The samples, in each case, were analyzed for uranium only. Below is a listing in parts per billion of uranium, of all sample results from this series.

Sampled during week ending	3-19	3-26	4-2	4-9	4-16	4-23	
Location							
Original sample point 1-W (Poplar Creek inlet NE of K-303-8)	0	1	3	2	0	0	
Upstream (in same system) of all process and stores additions	3	2	6	5	2	0	
Upstream of all K-1300 and K-1401 additions	0	0	O	O	Ö	Ò	

Sample point 1-W had been running higher than the above results show when this program was started. Unless higher results than those above appear before the end of May it must be assumed that the previously reported results were due to a local condition which has since been cleared up.





In this case the results give very positive indication that the previously reported contamination arises from one or more of the four buildings served by the line sampled in the final sample littled above. The zero results appearing at the original sample point might be interpreted as indication either that some other point had previously been contributing contamination to the main system, or that this point had in the past contributed even more than the relatively high amounts reported above. The general pattern however, followed at all these check points, of decreased amounts of contaminant indicates general improvement of acitye material handling since the start of the Water Contamination Program.

Water samples for this check point were requested during May at points chosen to establish which of the individual buildings, in the area pointed out by the April samples, or which combination of buildings is responsible for the reported contamination. A general study of all buildings in the area, (K-1301, K-1303, K-1409, and K-1405), made during April but not including any actual sampling, indicated that no evident simple solution exists as all procedures and installations seem to be in order. As soon as sample results indicate any particular buildings of this group, new schedules will be drawn up to trace the contamination to its source.

VII. SPECIAL PROBLEMS

K-312-1 - Cell 9, Carbon Seal Change

A carbon type Valley Iron Pump seal change in the top purge building was audited with particular interest. The high activity of material in this building required that special precautions be exercised during this Maintenance operation. Air and surface contamination was found to be many times greater than that found during Allis-Chalmers Pump seal changes. Finely powdered contaminated carbon was responsible for the increased personnel hazards. Hand counts as high as 20,000 alpha c/m were found on a Health Physics surveyor after hands had been washed once with soap and warm water. Several washings with soap and sodium bicarbonate were required to reduce the hand count to below tolerance level.

K-1303 Trial Converter Decontamination

A study was made of methods of decontaminating converters to activity tolerances, prior to retubing. Air alpha activity readings were taken during the cutting of the converter bell end, removal of the tube bundle and placing of the tube bundle in the decontamination tank. Surface and wipe readings were taken the converter tube bundle before decontamination and after decontamination. In some cases tubes were removed, split open and flattened so that the inside surface of the tubes could be counted. Results to date indicate the the nitric acid wash is satisfactory.



The study indicated that contamination hazards to personnel will be minimized during the maintenance and decontamination phases of the converter retubing program.

Dust Respirator Tests

Tests are being run on dust respirators as an effective protection from alpha airborne contamination. Approximately ten (10) sets of samples taken in the K-306 and K-312 Sections show that alpha activity as high as 156 c/m/ft³ can be reduced to below tolerance activity. Two Filter Queen air samples are run simultaneously. One sampler is equipped with a holder for the dust filter, the other sampler used as a normal for comparison. Tests are being continued.

Instrument Development and Procurement

The pre-amplifier type poppy radiation meter has been giving very satisfactory service. It is expected that additional units will be fabricated shortly.

A Zuto circuit to be used with a long narrow probe was revised so that the desired sensitivity of 100 c/m would be attained. An experimental model is being constructed.

The experimental model hand alpha counter placed in the field for testing more than six weeks ago has operated satisfactorily; a second unit of improved design is more than 50% complete.

A long probe for clothes monitoring is being tested. A probe of a design similar to a single chamber of the hand probe but with grounded wires between the collector wires was tested. The following are some of the data:

Gieger voltage
Operating voltage
Bias
Background
Sensitivity
2175 volts
2125 volts
-7 volts
3.5 counts per minute
34.7% of a 105 alpha counts
per minute source

Tests made with the same chamber, ground wires removed:

Gieger voltage
Operating voltage
Bias
Background
Sensitivity
2175 volts
2125 volts
4.2 counts per minute
37.4% of a 105 alpha counts
per minute source

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A three wire surface probe of four (4) times the sensitive area of the standard probe, or 146 cm², was completed and is now being field tested.

Gieger voltage 2190 volts
Operating voltage 2175 volts
Bias -7 volts

Background 4.4 counts per minute
Sensitivity 31.3% of a 105 alpha counts
per minute source

Weight of three wire probe - 1095 grams.

Weight of standard single wire probe (without meter on probe handle) - 451 grams.

Some revisions are to be made in the design of the three wire probe to decrease its weight.

Eleven AC Poppy Alpha Meters have been fabricated by the Instrument Department Electronic Shop and are being distributed. Twenty Zuto Alpha Meters similar to the Victoreen model 356 are also being fabricated in the Electronic Shop. It is anticipated that they will be completed by May 21, 1948.

The completion date of 16 "Tornado" nine (9) cm. flat filter air samplers is May 17, 1948.

The above instruments will be distributed to operating groups to facilitate broadening the scope of routine radiation survey work.

Shipping Department Procedures and Handling of Contaminated Equipment

At a conference held with the Manufacturing Office Division, it was agreed to set up procedures to check equipment in stores. Tentative arrangements were also made to check all equipment coming into stores to be sure it was not contaminated and to initiate procedures whereby each division originating a shipment to stores would be responsible for clearly marking all equipment as clean or designated for scrap or decontamination.

Film Strip Tekt

The revision of the text for the proposed film strip on radioactivity hazards was completed and forwarded to plant supervision for comments.

Solid Sample Grinding

Work was started in the Uranium Analysis Section on solving the problem arising from the necessity for grinding solid samples contain-

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ing alpha active material. The original grinding installation was abandoned in January because dusting was found too high to maintain alpha tolerance levels. In addition to the personnel protection problem, any grinder must be capable of complete cleaning to prevent intercontamination between successive samples, since the grinding operation proceeds analysis.

The present hand grinding, by means of mortar and pestle, carried out in a hood, is being used by the laboratory to handle the regular work. An order for a stainless alloy mortar and pestle has been made. This should help the laboratories cleaning problem, but will not improve the personnel contamination hazards still involved in the present method.

A wet grinding procedure was suggested which will accomplish the dual purpose of eliminating all dust, as well as simplifying decontamination between samples. Inquiries on several types of wet grinding mills, have been made and it is hoped that a satisfactory solution will be found by next month.

The Radio-Chemical Laboratory

Shortly before the end of last year, the design of a radiochemical laboratory was undertaken. Several design problems involving Health Physics arose. These problems which have been mentioned in the special problems section of previous reports include the ventilating stack and its location, the shielding of the drum used to transport the hot solution, and the design of shields for laboratory containers.

In addition, the operation of laboratory rooms on tracer levels necessitated special procedures and monitoring to control health hazards. A system of personnel monitoring, records, and surveys on a routine and spot-check basis is being initiated. New detection equipment was ordered.



APPENDIX

A tabulated summary, consisting of two Tables, based on Radiation Hazards Spot Checks is included in the Appendix. Table I consists of locations which are expected to be hazardous and protective equipment is mandatory. Table II consists of regions known to be hazardous infrequently therefore, protective measures are taken during the known hazardous operations.

This type of reporting is intended to show the extent of contamination, existing in a location, together with the protective measures and personnel monitoring practiced by the operating group. The seriousness of the contaminated areas, in respect to the number of persons exposed in a twenty-four (24) hour day, is shown by estimating the number of persons entering or working in a given locale. This is a first estimate and it should be recognized that the figures given are approximations.

HEALTH PHYSICS SUMMARY

Based on Spot Checks by Radiation Hazards Department

TABLE I

Locations Expected to be Hazardous - Protective Equipment Mandatory

1	number	Prote Measu in Fo		Type of Personnel Monitoring	el ing	e Alr ty (ty)	sera (Saria (Saria)	Av. of al Rdgs. in Location Surveys	0 K 01	lax. king all	Av. per c of Work Location Tolerance		•	Av. per cent of Work Loca- tion with Wipe Activity	per cent fork loca- n with Activity	Radioactive Material Releases	ctive al es
	.xorqqA	Cont	areq to Of Pere Con to Mag	Alpha	1	Beleva ivitoa (m/s)	1	Alpha Cont. (c/m) (c/m)	Beta Cont. (c/m)	Rad. mrep/ 8 hrs.	Alpha Beta Cont. Cont. (%) (%)	Beta Rad. Cont. (%) (%)		Alpha Beta Cont. Cont (%) (%)	٠	No. of Re-	No. of People Sent w Disp.
K-306-7 Product Withdrawal Area	6	ð	8	Hand	8	1	श्रम्भ	14,500	9	8	7°7	8	8	0.25	9	m	۵
K-1301 Oxide Grind Room	, CU	G, C M, SG, H	. 6	Hand Count	8	1	計	11,500	t	0.0	95.0	i	8	95.0	1	o 1	. •
K-1301 Oxide Weigh Room	Ø	က္ ကို အ	1	Hand Count	ŧ	. 8	1111	13,000	8	0.0	o. 9	8	j	0.09	8	0	0
K-1301 Oxide Con- version Room	ત્ય	ရ က 🛪	. B	Hand	8	ı	750	5000	i	0.0	و 8	ı	8	5.0	ŧ	0	0
K-1303 Equipment Decontamination Bldg.	#	ပ ့ အ အ အ	e (Hand	â	ı	1,600	1240	ı	6.0	75.0	1	ı	50.0	1	•	0
K-1401 Vacuum Pump Shop	27	တ္ <u>အ</u>	j l ≥	Hand Count	8	1.0	6,354	6,354 10,000	8	500	1,5	1 -	1	1.0	8	0	•
K-1405 Chemical Engr. Development Building	و	ရ ကို <u>ဆုံ</u> စ	ŧ	Hand Count	8	1	1,250	2500	1	8	ຸດ	1	ŧ	6.0		~	0
K-1401 Vacuum Fump Shop	27	ශ ක ලේ වේ		Hend Shoes	8	-4	6354	6354 10,000	8	.05	9.t	i	4	H	1	0	0
,																	

C-Coveralls M-Assault Mask R-Respirator S-Shoe Covers H-Head Cover G-Gloves

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HEALTH PHYSTUS SUMMARY

Based on Spot Checks by Radiation Hazards Department

TABLE II

Hazardous Infrequently - Protective Measures Prescribed for Job

					•												
1 0 0	Tedmun.	Frote Measu in Fo	ective rres	Frotective Type of Measures Personnel in Force Monitoring	of inel oring	_ ~ Z3_	seta . (Sinja (Sij)	Av. of al Rdgs. in Lecation Surveys	la ta co	8 T	Av. per cent of Work Location above Tolerance	r cent k on abou		per ork I Acti	٠	Radioactive Material Releases	stive al
TOTOTOTO	xorqqA*	Cont.	Rad.	Alphe	Bets	gs19vA ivitsA \m\s)	Approx of Mor Locale	Alpha Cont. (c/m)	Beta Cont. (c/m)	Rad. mrep/ 8 hrs	Alpha Cont.	Bets Cont.	R 8d, (%)	Alpha Beta Cont. Cont (%) (%)	, -1	No.of Re- eases	No. of People Sent to Disp.
K-101 C-816 Stripping Building	m	z z	0	None	0	8	00 1	400 15000	Ð	8	1.0	8	Õ	ຣໍກ		m	56
K-131 Feed Purification Building	_	乗 む む	t	None	ı	8	2200	2500		83.P	41. 0		0	0.05		0	0
K-631 Waste Disposal Building	_	න ර	ŀ	None	•		800	3200	ŧ		9.0		0	0.0	. 0	ณ	
K-300 Coded Chemical Vaults 1-X	-	ဗ	6	None		ŧ	12000 17 600	03/1	i.	ð	بر ق	i	ا	3.0		0	0
8-A	m	ပ စ	t	None	ı	i	14000 16500	16500	- 8		3.0	1	ณ	2.0	1	0	•
15-4 ⋅	m	စ	1	None	· g		17500 3900	3900		. I	0.1	*.	0	0.01		0	0
16-A	#	့ တ	1	None	ı	f	1750 29000	9006	. " •	i	6.0	•	#	· 0°4	ı	0	0
17-A	m	o o	Đ	None	ı	ŧ	17500	1200 14200	. 1	i	စ. လ	ı	-	1.0	í	• @	0
K-402-1 through K-402-9 Line Recorder Stations	65	Ġ	· •	None	ŧ		2000	1300	ŧ	á	0.15	1	6	0.0		•	0
K-311-1 through K-301-5 Line Recorder Stations	8	Ф	ı	None	t	ı	2400	0	\$	ı	0.0	1	Ö	0.0	1	0	0
K-302-1 through K-30340 Line Recorder Stations	no	ტ	1	None		i j	3200	1100		ı	9.0	1	0	0.1	,	•	0

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	Radioactive Material Releases	No. of Poople Re- Sent to leases Disp.	0	0	0	0	0	0	0	0	0	•	0
		No.of Re- leases	0	0		•	0	0	. •	0	٥	0	0
	Fork loss- on with	Beta Cont. (%)	B	1	8	8	8	1	. •	- 1	ı	1.	ł
	Av. per ce of Work Loc tion with Whe Activi	Alpha Cont. (%)	.03	, 0°	3.0	0.7	2.0	0.01	0.1	1.0	0	0.1	0
	cent above	Rad. (%)	8	ŧ	8	. 8	1 .		9	. (ı	ı	1
	per ce fork tion a	Beta Cont. (%)	. 8	9	9	· 9	1	ı	1	4	. 1		1
	Av. per ce of Work Location a	d. Alpha. ep/Cont. hrs.(%)	90°	0.25	5.0	1.1	3.0	80	0 8	⊙	0	٥. ٥	•
	Vorking of all	Rad. mrep/ 8 hrs	B	8	ø		ı	. 0		. 8	ě	ı	1
		Beta Cont. (c/m)	0			\$	1	1		6	ŀ	9	1
• •	Av. of a. Rdgs. in Location Surveys	Alpha Cont. (c/m)	7100	h200	ည့်မထ	21,000	19800	2600	3200	5000	0	1600	0
	sera . (Sfrings)	xorqqA roW to	3200	2000	200	100	12000	1000	100	800	800	\$100	00
	7. 4	Averag LvitoA (c/m/	8	1	t	1				1	ı	ı	
	of inel oring	Beta Gamma	8	i			i	9		1	ı	ı	ŧ
	Type of Personnel Monitoring	Al pha	None	None	Hand	Hand Count	Hand Count	. 1	None	None	None	None	None
	ttve es	Red.	8	ŧ		0 .	ŧ	ŧ	. 1	t	6	•	ŧ
	Protective Measures in Force	Cont	.	ø	ပ ပ	<u>စ</u>	None -	None	None	None	None	None	None
	sounes.	kelqqA*	128	8	. 01	m	W	0	~	m	m	₩.	Q
	8 4 9 9 1		K-304-1 through K-305-11 Line Recorder 120 Stations	K-305-12 through K-312-3 Line Recorder Stations	K-305-12 Product Cy- linder Head Repair Shop	K-306-6 Product Cy- linder Assembly Shop	K-312-1 Basement	K-312-3 Cold Trap Room	K-300 and K-400 Process Instrument Shops K-301-4	K-303-7	K-305-9	K-305-10	K-402-9

TABLE II, Cont.				•	d	ECRE	EH.											
	namber		Protective Measures in Force	Type Pers Moni	of onnel toring	Δ.	sera (Sari:	Av. of a. Rags. in Location	1 H 0 1	Norking of all	Av. per c Work Loc above	r cent of Location	A .	Av. percent of Work Loss tion with Mps Activity	per cent fork Loca a with Activity	Radioact Material Releases	Radioactive Material Releases	
Location	.xorqqA* sreq lo	Cont.	Bad.	Rad. Alpha	Beta	Average tytyty t/m/s)	Approx.	Alpha Cont. (c/m)	Cont.	Rad. mrep/ 8 hrs.	Alpha Cont. (%)	8 +i ~	Red (%)	Alpha B Cont. (%)	Beta Cont.	No.of Re-	No.of People Sent to Disp.	
K-300 and K-400 Process Maintenance Shops K-310-1	李	A D	1	None	0	8	1350	0	ŧ	8	•		•	©		0	<u>o</u> .	
K=309=3	#	M,G,C	8	None	ı	8	1350	3000	0	8	ى 9	9	ŧ	0°	ı	0	•	
K~302~1	∞	a S	j	None	₽,	ı	800	0	, I	8	0	ð		0	·	0	0	
K-302-5	9	S S S	8	None	6		900	2200			° %			1.0		0	•	
K-305-12	m	M, G, G	1	None	9	1	300	3000			0.5			π°0		0	O -	
K-312-2	W	M, G, C	8	None	8		800	800 1680			0.3			0.1		0	•	
K-402-9	M	M, GO	8	None	ı	8	700	1100			1.0	٠		1.0		0	•	
K-1024 Electronic Instrument Shop	*	o	9	Hand	6	1 gm	2520	1600	1	! .	0.79	1 -	1	+ . € `∵	8	0	0	
K-1024 Pneumatic Instrument Shop	2	ø	i	8	8	1 c/m	3300	150	1	ı	0.0	41.1		ŧ	t ,	0	0	
K-1401 Scrap, Clean- ing Safety Shop	身	ඡ	1		1) # 	0 0 1 29	1000	8	. 4	0.0	1,	1	1	F 1	O	0	
K-1401 Valve Shop	60	Ġ	1	Hand	ı	1 c/m /ft3	2160	5000	1	8	0.0	t	i ,	1	t	0	0	
K-1401 AC Pump and Seal Shop	.	ප	. 8	Hend	ı	1 c/m	1660	150		1	o လ	i	t	a ti A a est e		0	0	
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Radioactive Waterial Releases	No. of People Sent to Disp.	None	None	More	Norige	None	None	None	None	None	None	None	None	11
Radioact Material Releases	No.of Re- leases	None	None	None	ત્ય	None	None	None	None	None	None	None	Nene	
per cent Work Loca- n with e Activity	Beta Cont. (%)	00	0°0	000	0.0	0.0	-0	0	0°0	0°0	0°0	0.0	0.0	
Av. per cent of Work Loca- tion with Whe Activity	Alpha Cont. (%)	1°7	0°0	0°0	0.22	0.17	0	. 0	0,24	0,19	0°36	0°0	0,58	
nt of fon	Rad (%)	0.0	0°0	0.0	0.0	0.0	0.	0.0	၀ ၀	0.0	0°0	0.0	0.0	
	De ta Conto	0	00	0		o o	8	0	0	0	0.0	0°0	0.0	· .
Av. per c Work Loca above Tolerance	Alpha Cont. (4)	1.4	180	0°39	60	0.67		0.38	0.33	0.51	0.55	0.0	1.01	
l Max. Working of all	Rad. mrep/ 8 hrs	ى ئە	Bkgđ.	Bkgd.	Bkgd.	8	0	3.0	0	0	0	0	0	
정도로	Cont. (c/m)	Bkgđ. 2.0	Bkgd。	Bkgd。	Bkgd.	. D	9	0	0	0	0	8	. 0	
Av. of a Rdgs. in Location Surveys	Alpha Cont. (s/m)	1500	24000	3600	1800	1200	0	1700	3000	1100	4300	100	9700	
(231)	Approx of Wor Locale	1409	218	777	1790	4191	797	1051	9605	1568	1640	200	1380	7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Ϋ́2.	Serek Lvitoa (m/o)	0°3	0	0°0	0.07	0°08	8:	8	0 <i>j</i> . <i>I</i> .	0	0.08	ā	0,18	***************************************
of nnel	Bets Gamma	When Pres.	0	Then Pres.	When Pres.	None	Hand None	None	None	None	None	None	None	
Type of Personnel Monitoring	Alpha	Hand	8	Hand	Hand	Hand	Hend	Hand	Hend	Hand	Hand	Hand	Hand None	
Protective Measures in Force	Red.	None	None	la:	None	None	NE.	BC	None	None	None	None Hand	None	
	Cont.	Gn L,A	р (Д	7.8 H	GD, H, H, F, F, T,	Cn, T, T	None	None	Gn L,A	Gn L, A	Gn L,A	Gn L,A	a F A	
c.number reonnel	corqqA* req lo	75	B	*	20	EZ.	N.	₩	79	6	77	r.	27	
Location		Sampling Section	Solution Storage	Radiation Section	Uranium Analysis	Counting Section	Electronic Section	Metallurgy Section	Spectrometer Section	Spectrometer Standards	Analytical Research	Molecular Spectroscopy	Physical Chemistry	
		Samp	Solu	Radia	Uran	Coun	Elect	Meta]	Spect	Spect	Ana 13	Molec	Physi	

Location	x. number		Protective Measures in Force	L	Type of Personnel Monitoring	ty ₅)	Av. of all Max. Av. of all Max. Regs. in Working Antherese	Av. of Rdgs Locati	Av. of all Max. Rdgs in Workin Location of all Surveys	Max. rking	Av.per cer Work Loca above Tolerance	Av.per cent of Work Location above Tolerance	t of i	Av.per cent of Av.per cent Work Location of Workloca- above tion with Tolerance Wipe Activity	cent Loca- ith tivity	Radioactive Material Releases	ctive al
	orqqA*	Cont	Rad	Alpha	Cont. Rad. Alpha Gamma	Average LvitoA (m/o)	Approx Locale	Locale (c/m)	Cont. (c/m)	Alpha Cont, Red, A. Cont, arep/ C. (c/m) & hrs.	Alpha Cont. (%)	Beta Rad. Cont (%)	Rad . (%)	Alpha Beta Rad Gont Gont (%) (%) (%) (%)	Beta Cont. (%)	No.of Re- leases	No.of People Sent to Disp.
Conditioning Section	20	Gn L, A	None	When Pres.	None	0°4	7864	2864 550	8	0	0,21	0°0	0.0	0.21 0.0 0.0 0.14 0.0	0°0	Nome	None
Barrier Research	7	Gr.	Gn L, A None	When	None	· ·	1246	1246 2540	8 .	ġ	0°4	0°0	0°0	0.0 0.0 0.16 0.0	0°0	None	None
Critical Mass	8U .	GH A H E	2	Hand	When Pres.	1,05	2470	g	. 8	8	0	. 0	8	0 **	9	None None	None
Special Analysis	23	Gn L,A	None	Hand None	None	Q	1600	1600 15000	0	0	69°0	0°0	0.0	0.69 0.0 0.0 0.13 0.0	0.0	None	None
					e reer												

Table II

⁻ Gloves

⁻ Coveralls

⁻ Assault Mask

⁻ Respirator

⁻ Shoe Covers

⁻ Lab Coat

⁻ Rubber Apron - Lead Wall Shielding

⁻ Neoprene or Rubber Gloves

This column represents the number of persons who will be in this work area during a twenty-four (24) hour period. E - Other Mechanical Equipment

F. Concrete wall shielding

A. - Concrete wall shielding

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-894 (Oct'48)



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HEALTH PHYSICS ACTIVITIES FOR NOVEMBER 1948 Short Title of Document

S. Visner and C. L. Gritzner

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K-25 PLANT

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HEALTH PHYSICS ACTIVITIES FOR NOVEMBER, 1948

Compiled by S. Visner and C. L. Gritzner

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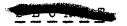
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Title: Report of Health Physics Report number: K-178, Part XI Activities at K-25 Plant File number: for November, 1948

Date of issue: December 15, 1948 Authors: S. Visner

C. L. Gritzner

CARBIDE AND CARBON CHEMICALS CORPORATION

K-25 PLANT

Oak Ridge, Tennessee

ABSTRACT

Herein are reported Health Physics Activities in the K-25 Plant for November, 1948. The results of area and personnel monitoring, water surveys, and investigations of special problems are included. A summary of Health Physics spot surveys and of reported routine surveys is presented in tabular form.

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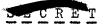
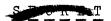


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I.	Summary
II.	Introduction
III.	Organization
IV.	Radiation Surveys
v .	Personnel Monitoring
VI.	Radioactive Material Releases
VII.	Area Water Monitoring Program
VIII.	Special Studies
IX.	Educational Program

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I. SUMMARY

The following tables are a summary of reported routine surveys made by operating groups, and of spot surveys made by the Radiation Hazards Department, in various locations throughout the plant. A comparison of these tables with the tables for October reveals very little change in the intensity of contamination or areas of working locations contaminated. However, a decided decrease in the number of routine survey reports submitted by operating groups is evident in this comparison. Eighty-three (83) locations throughout the plant are listed in the summary tables. Results of job surveys are not included in these tables, but may be found in Section IV of this report along with more detailed information on locations where a significant change in contamination levels has occurred.

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Symbols used in the following tables are:

B - Boots or Aubbers
LL Meridge Time Limit
T - Tongs
E - Other Mechanical Equipment
WC- Concerne Woll Statistics
R- Tins Counter Woll Statistics
R- Will be in this work stee during a rewrity-four
L information
— In Information

HEALTH PHYSICS SUMMARY TABLE I MOTEMBER 1948

			REMARKS		Frequent recontomination	Above telegrance beta radiation at surface of grind equipment	Contamination caused by exide transfer operation	Decontaminated frequently	Above tolerance beta radiation located at surface of oxide material in lead trays	Improvement over previous month evident	Above tolerance beta radiation at surface of cardboard oxide containers	Proper precautionary measures are in effect	Above tolerance beta radiation Recated at curface of carbon trap seriess	About 1 me total settrify. Radiation due to samples	Restricted outp. See text.
Ī		-	RAD.	B HRS.										8	1286
		SON		BETA CONT. (C/W)		-									•
	GROUP	MAXIMUM READINGS	KIPE	ALPHA CONT. (C/M)							93	1015		012	•
	OPERATING GROUP	MAXIM	ų	BETA / CONT. (C/W)					<u>_</u>					1	•
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	RVEYS		L	RAD.										•	*
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	REPORTE			AIR- BORNE ALPHA	•	•	0	•	÷ .	•	•	0	•	0	h
		NUMBER	OF REPORTED SURVEYS	BETA GANIKA	•	•	•	•	۰	۰	۰	•	•	10	. 9
-			•	ALPHA CONT.	•	•	0	•	-	۰	-	so ·	•	10	
Ī	1	RCENT	WIPE WIPE	BETA CONT.	,		•	,	,	•	•	,	,	1	NCLASSIFIEL
	2	VERAGE PI	OF WORK LOGA- TION WITH WIPE ACTIVITY	ALPHA CONT %	46.0	0.08	0.0	0 .	29.0	0.	10.0	1,0	25.0	0.27	; Ø
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ondatory	RTMEN	PERCENT	WORK LOCATION ABOVE TOLERANCE	BETA CONT.	•	•	•	•	,	•	•	•	•	,	· Ö
s ore M	OS DEP	AVFRAGE	WORK LO TOLERAN	ALPHA CONT.	46.0	0.00	0.0	7.	38.0	0.9	26.0	0.0	0.0	02.0	; Z
. Device	HAZAR			RAD. MREP/ 8 HRS.	16.4	115.0 100.0	81.0 100.0	0.	129.0	0*0	126.0	000	150.0	120.0	108.0
Protective	ADIATION		READINGS IN WORKING LO- CATION OF ALL SURVEYS	BETA CONT. (C/M)	•		•	•	•	•	•		•	•	,
Where	٠		READING CATION	ALPHA CONT. (C/M)	19400	>28500	\$5000	29000	21000	\$000	2600	1500	14000	900	v 180
Locations Where Protective Devices ore Mandatory	[GENERAL LOCATION OF CONTAMINATION	O HISHWON	Floor and 4 equipment	Floor and 4>	Floor and 4	Floor, work 8 bench, tools and equipment	Floor and 6 equipment	Tables and 6 benches	Floor and •	Floor and 4 equipment	Floor and S equipment	Hoods, work 1 table and equipment	Containers, 63 (416):11ss, 64 (416):15ss, 64 (416):
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	AIR CONTAMINATION			TRIVITY TRIVION TRIVION			•	8 47.0			•	•		r 1	
	CONT	LONG -TERM SAMPLES	3:00	TOLERANC AVERAGE	•	•		ŏ 	·	•			<u> </u>		•
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	RADIOAC	MATERIAL RELEASES		RELEASES	•	•	•		•	•	•				0
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-		+			Count	Gount	Hand	Commo	Count		Count	Gount	Count	Hone	ount Count
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	30	¥76	13 13	41X0849A [#] NWO3#34	•		*	28	6	88	•	•	10	•	*
			LOGATION		K-1501 Oxide Conversion Room	K-1301 Oxide Orind Reom	K-1501 Oxide Weigh Room	K-1305 Decontamination and Recovery Room	E-1505 Cubiales (Uranium Recovery)	K-1401 Vacuus Pung Shep	E-1406 Oxide Shaker Reca	K-1405 Middle and East Rooms	E-1410 Decentamination and Storage Building	E-1004-D, Room 30	F.1004-1,

HEALTH PHYSICS SUMMARY TABLE III MOTHRIR 1948

		REWARKS		Contembrated sormy removed from building	Decontaminated frequently	Decontaminated after surveys	Descatastinated frequently	Descutaminated frequently	Decembrainated frequently		Restricted entry	Restricted entry	Restricted entry	Restricted entry	Tools are sheaked for some tamination		_	Contamination caused by material release			Descrimminated after surreys	Deconteminated after surreys	Description of the serve.	Decomteminated after surveys	Decontaminated frequently	Prequent decontradantion
			RAD. MMEP/ 0 HRS.		#	2									-											
	DINGS		BETA CONT. (C/M)		•	,																				
GROUP	MAXIMUM READINGS	¥	ALPHA CONT. (C/M)		ı	•						ğ	8100	1050							•	2	\$	34	1	1200
BY OPERATING GROUP	1	8	BETA CONT. (C/M)		1																			·		
		SUR	ALPHA CONT. (C/M)		00 42 	8						8	3400	9							9111	9576	3	8106	8 2	28000
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ORTED	\vdash											<u> </u>	91	<u>\$</u>		-			•		_	_				
ğ	le R	EYS	BETA AIR- GAMMA BORNE ALPHA	•	*	· .	•	•	•	•	•	<u> </u>	-	-	•	-	•	-	-	•	•	_	-	•	. 0	-
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F		. ы	-	•	. *	• 😜	•	۰																	<u> </u>	
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ENT SU	CENT OF	WORK LOCATION ABOVE TOLERANCE	BETA RAD.		8	3	0	•	8	3	<u>'</u>	•	<u>.</u>	•	•	•	3	3	1	•	•	•	<u>.</u>	<u>.</u>	·-	'
DEPARTN	RAGE PER	RK LOCATI	ALPHA BE CONT. CO	0.	00°0	3	98	20000	9000	00	3	10.0	1000	10.01	10*0	9	0.0	90.0	0.0	0*0	0000	•	0.0	3	0.03	1000
RADIATION HAZARDS DEPARTMENT SURVEYS	CHOMO AVE		RAD AL	•	0.75	0.8	•	9	0.3	0	1	.	•	.	•	•	9	3	•	•	-	-		.	•	-
TION HA	F ALL MAN	A WORKIN	BETA CONT. (C/M) B		•	•	•			,	•	•	1	1	•	•	•	•	•	•	•	,		•	•	•
RADIV	WERAGE O	READINGS IN WORKING LO- CATIONS OF ALL SURVEYS.	ALPHA CONT. (C/M)	2800	8	V 200	10000	8	1400	4200	12000	0009	2000	10000	\$1000	00 2 ×	99	14200	002 >	00% >	629	7 200	00 V	8	9700	0008
	_	GENERAL LOCATION OF CONTAMINATION	10 H39WUW	Fleor and 2 tubing on fleor	Floor between 5 feed bath and eylinder	10	Equipment and 5 seal disc in for trial de-	Floor around 6 sampling points and washing when the property of the points and pages and pages are present to the pages of	Floor around 5 earbon trape	No above tol. 4 erance con-	- 10	Ploar	Nork bench 4	4	Gressent 1 wrenches and putty knives	No contant-	Base of K-402. 1 5 line re- corder housin	Housing of 1 feed filter	No alpha con- tamination found	No alpha con- temination found	L-505-9 sampl 1	-	-		Work bench, floor and tes	Floor, table tops tops and test
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R CONT	LONG-TERM	300	TOLERANCE TOLERANCE	<u>'</u> .	•		•		•					•	•		'	•								
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HEALTH PHYSICS SUMMARY TABLE III BOYBITH 1948

Weathering causes steady improvement Radiation on a container of Hanford material Above telecture radiation at surface of samples not regularly Contamination well controlle Decontaminated after surveys Decontaminated after surveys Contamination well controlls Precautionary measures are in effect Contamination found on converter heads and shells Contamination due to a new operation Proper precautions are in effect Decontaminated frequently Furniture received from contaminated areas Decontaminated after REMARKS 144.0 RAD. MREP/ 8 HRS. BETA CONT. (C/M) MAXIMUM READINGS ¥ P. 3450 2 01V ş 12359 ALPHA CONT. (C/M) 35 6250 8 104 170 REPORTED ROUTINE SURVEYS BY DPERATING GROUP BETA CONT. SURFACE ALPHA CONT (C/M) 930 2600 2777 7500 8 800 2200 0000 4760 1100 2000 AAO. ~ NUMBER OF ABOVE TOLERANCE READINGS BETA CONT. . CONT ß 23 27 97 12 2 ន 493 AIR-BORNE ALPHA • 0 0 0 0 0 0 ó ۰ ۰ ю ۰ ۰ • BETA ۰ 0 0 0 ۰ 0 0 0 0 ALPHA CONT. 0 • ۰ 0 0 23 2 BETA CONT. ٠ 2000 0000 0.001 900 ALPHA CONT. ŝ 800 0.1 1.0 0 0.0 0.0 0 2.0 0.0 0.0 00 6.0 0.0 0.0 0 0 3 ွ 0 RADIATION HAZARDS DEPARTMENT SURVEYS 0000 0.0 0.0 00 0 000 ၀ 000 3 0 0 00 9 • 0 °. 0.0 နှ 9 ğ % AVERAGE OF ALL MAXIMUM AVERAGE PERCENT OF READINGS IN WORKING LO- WORK LOCATION ABOVE CATIONS OF ALL, SURVEYS, TOLERANCE BETA CONT. 0.008 8,0 900 0,002 8000 80 0,001 000 0.0 0 12.0 0 35.0 0 0.0 1.5 0:1 8.0 0.0 0.0 ALPHA CONT. 16.0 7 °°0 0 48.0 000 RAO. MREP/ 8 HMS. 16.0 9 8.0 3 **6.9** 3 0,0 000 0 0.04 ÷ • 0 BETA CONT. (C/M) . . , . . . i, • . ŧ \$000 96 **₹** 2000 200 200 11800 1700 900 5500 9 8 800 900 46000 8 800 1500 1500 25000 3800 1500 8 **2** ₹500 Work surface and equipment Inside hoods and in sink Nork surface and equipment Floor, work surface and equipment lee box and sank Ploor and equipment Equipment and floor Noth surface and equipment Drain boards Work surface Floor, work surface and equipment surface Throughout yard Table tops Floor and equipment Converter perts Purniture Poor 71001 1 Morris SOLERANCE SPOT 0 0 0 0 -0 0 0 Ο. • 0 0 AIR CONTAMINATION • н . • • • • 0 0 ٥ 0 0 0 # MERAGE AIR LONG-TERM SAMPLES OLERANCE 30448310 ۰. 0 0 S39USO4X NO DISPENSARY PEOPLE SENT NUMBER OF RELEASES NUMBER OF • • 0 0 ٥ 0 • • • ٥ • Hend Count, Prt. Chub. Pila Badge, Frt. Chub. Film Badge Pilm Badge Prt. Chmb., Film Badge Prt. Chmb., Film Badge Pile Bedge Жове None None None Youe Hone None None Hone None TYPE OF PERSONNEL MONITORING Eand, Shoe Hand, Shoe Count Eand Count Eand Count Hand Count Count Count Fand Count Count Hernd Count Hand Count Hand Count Hand Count Hone Rend Count Count Hone None Моде Hone None None Hone Kone Mone Hone Hone ¥, None None Hone Mone Hone None None MOITAIDAR Hone None None Mone None PROTECTIVE MEASURES IN FORCE **3** 0 0 0 6n, L, G, L, A Gα, L, Α da, L ф. Т. , a, r ₽, . og tr None None None ပ္စ္ 0,0 0,0 0,0 0,0 220 8 1780 4190 2100 1.570 1640 1280 1250 2860 3470 1970 8000 2500 \$300 150 8 360 1200 890 1600 PPROXIMATE NUMBER OF . 4 ٠ • . 2 28 7 27 20 22 22 ន 2 8 \$ 2 K-1050 Electrical Maintenance Bailding K-1062 Hot Salvage Yard Spectrometer Standard Spectrometer Section K-1024 Instrument Shops Electronic K-1401 Salvage Section Amelytical Research Physical Chemistry Section Barrier Research Section Conditioning Section Critical Mass Section K-1401 A.C. Pump and Seal Shop Uranium Amelyeis Section Counting Section K-1212 and K-1213 Shipping & Reseiving K-1401 Cleaning Area Radiation Section Special Analysis Setion Solution Storage K-1401 Pilot Plant K-1401 Valve Shop Fluerocarbon Section Phetma tite LOCATION K-1016 Laundry

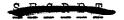
NOTALISM LYNG

Protective Devices are Prescribed for Specific Jobs

Where

Locations

HEALTH PHYSICS SUMMARY TABLE II NOTSHER 1848



II. INTRODUCTION

The following are the highlights of Health Physics Activities in the K-25 Plant for November 1948.

The program of area and personnel monitoring in the plant for radioactive and penetrating types of radiation was continued. In general, potential hazards to personnel from these sources remained under control with no important change in levels of activity.

Investigations have been made to determine safe methods of operation in order to minimize personnel exposure to radioactivity. A report was issued in connection with retubing operations to converters removed from the cascade in which an evaluation was made of each step of the operation. The maintenance operation in the cascade involving process pump and seal changes was also studied and recommendations made.

During November the water survey program was continued with greater effort on correlation of sampling with rainfall; the various samples being taken immediately after a heavy rainfall. In general, it was found that the previously reported background levels of radioactivity in ground and river water were verified, minimizing the possibility of extensive surface contamination on and about the K-25 area. The drinking water indicated a peak value of beta-gamma activity between November 19 and 21 of 426 disintegrations per minute per 100 ml which is approximately 20 times higher than normal. This rise may be attributed to an accidental release of greater quantities of beta-gamma emitting waste at X-10. The reported value is still below the best estimates of maximum permissible concentrations of beta-gamma emitters in water.

A concrete lined drum intended for the shipment of radioactive material was checked for shielding values by means of a 50 mg radium source, and a Geiger-Muller type radiation detector.

Field testing was started on a newly developed model of a two fold type alpha hand counter. Results to date indicate that this instrument is a reliable and comparatively inexpensive hand counter with a possibility of wide application in the plant.

The personnel monitoring program in the plant was continued. Results of film badge monitoring revealed no exposure to personnel above tolerance. The results of the finger pad monitoring were obscured by technical difficulties. The hand and foot monitoring revealed no significant contamination of personnel before eating or at the end of shifts.

The plant emergency rescue squads were given training in the handling of radiation emergencies. Training in the use of radiation detection instruments was included.





III. ORGANIZATION

The plant organization in regard to administering the policies pertaining to the protection of employees from potential radiation hazards remains essentially unaltered. The responsibilities and duties of the various groups concerned are set forth in the report for October, 1947.

IV. RADIATION SURVEYS

In accordance with its responsibilities, the Health Physics Inspection Section conducted surveys on an irregular schedule during the month.

The results of particularly noteworthy spot surveys are summarized as follows:

K-131 Feed Purification Building

A survey conducted on November 10 revealed ten (10) spots of above tolerance contamination with a maximum of 9450 alpha c/m (540 c/m, wipe). The cause given for this contamination which covered approximately 15 ft² of floor area, was condensation of steam from the feed cylinder baths dripping from overhead beams that had been previously contaminated by material releases. These spots, when rechecked, were found to be below tolerance, indicating that effective decontamination had been accomplished. The balance of the 5 spot checks during the month revealed no other significant contamination.

A beta-gamma survey conducted in the Furnace Room during the early part of the month using a 2610 meter, revealed radiation of 144 mrep/8 hrs (beta) at a box of aluminum washers. This box has since been filled with water to cover the washers and now shows a maximum of 40 mrep/8 hrs.

K-306-7 Product Withdrawal Area

Four (4) spot surveys were conducted in this location, revealing seven (7) above tolerance readings. The highest, 3500 c/m surface alpha activity (zero wipe), was found inside defroster hood. Operators working in this location wear gloves which are exchanged when they become contaminated. Operators' hands are checked twice daily. Daily six hour air samples taken in this room were all below tolerance. Spot checks of hand contamination for operators here revealed no above tolerance contamination levels.

Line Recorder Maintenance Jobs

Two (2) line recorder maintenance jobs were audited during the month. The first job involved cutting lines and replacing valves in the K-306-6





Line Recorder Station. Measurements were taken of surface and personnel contamination during the job. One maintenance worker was found to have contaminated his hands to 1000 alpha c/m, and his coveralls to 500 c/m. Assault masks were worn while cutting into and heating pipes of the system. Air samples taken while masks were not being worn showed below tolerance air activity. Coveralls and canvas shoe covers were worn. Gloves were worn part time. All final hand counts were below tolerance.

The second job audited required the cutting of C-616 lines at the K-306-7 Line Recorder Station. Measurements were made of surface and personnel contamination. A tool chest and vise used by workmen showed >24,000 alpha c/m of surface contamination (>24,000 c/m, wipe). Masks were worn while lines were being cut. Coveralls, shoe covers and gloves were worn during entire job. Paper was placed on the floor around the station to prevent the floor from being contaminated. A 15 minute duration air sample taken 2 feet from open line after the worker had removed his mask showed the air activity to be approximately 1.5 times the tolerance level. Supervision was notified of this condition.

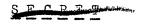
Maintenance Shops - Process

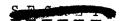
Three (3) spot surveys of the Process Maintenance Shops were conducted this month and it was found that the shops in K-310-1, K-309-3, K-302-2, K-312-2 and K-402-9 are comparatively free of contemination, since little contaminated equipment is worked on in these shops.

The activity levels in K-302-5 and K-305-12 Shops were high. These shops are used as headquarters for seal changing equipment and the storage of old seals until they are shipped to the K-1401 Seal Shop. Approximately 60 ft² of floor area in the front half of the K-305-12 Shop was contaminated with material showing 12,000 alpha c/m surface activity (3000 c/m, wipe). Several seal pans with visible material still in them showed a surface and wipe count of more than 32,000 c/m. The top of a metal work table 4' x 10' in this room was also highly contaminated.

Supervision was notified of these conditions and the room was decontaminated. Eight (8) days later another survey was made of this room and transferable material was found on the floor where seal pans were stored; 3000 c/m wipe was reported. Five (5) seal pans lying on floor in southwest corner of room contained visible material (21,000 c/m, wipe).

Approximately 18 ft² of the K-302-5 Shop floor area showed a surface activity of up to 14,000 c/m (2400 c/m, wipe). A seal puller lying on the work table showed visible material with a wipe activity of 3600 alpha c/m. A seal pan in this shop showed a wipe count of 7200 c/m. Contaminated seal pans are a major source of hand contamination.





Maintenance Jobs, Seal Changes and Pump Removal

Spot surveys were conducted of seven (7) seal changes and one (1) pump removal job during the month. With minor exceptions it was found that radiation hazards met with during this work have been minimized by proper use of protective equipment. A Health Physics study of these operations was made and findings, conclusions and recommendations were brought to the attention of the Maintenance Division.

Converter Changes

A survey was made of two (2) converter changes during the month. While surface and wipe contamination was high on converter and process piping flanges, four (4) air samples taken inside the cells while work was in progress showed the air activity to be below tolerance. In general, conditions met with during this type of work are being adequately handled in regard to the use of protective equipment and personnel monitoring.

Maintenance Vehicles

A spot survey was made of seventeen (17) maintenance vehicles during the month. Two (2) flat trucks were found to be contaminated. Maintenance supervision was notified and the trucks decontaminated.

Valve Repair or Replacement Jobs

Spot surveys made of five (5) valve jobs during the month revealed that proper safety equipment and safe precautions were used on all jobs. During one job, beta radiation of greater than 160 mrep/8 hrs was found on the seat and stem of a valve. When the valve was removed, the operator, who was properly protected with gloves, coveralls and assault mask, enclosed the valve in a paper bag and placed it in a covered metal container marked as being contaminated. The beta exposure was approximately 30 seconds in duration.

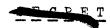
Cascade Service Jobs

Carbon Trap Servicing

K-631 Carbon Trap Room

An airborne alpha activity sample taken during the servicing of carbon trap #1086 gave a result of 5.5 alpha c/m/ft³. An air sample

Letter to R. A. Winkel from C. L. Gritzner "Health Physics Audit of Maintenance Jobs", December 1, 1948





taken in the exhaust of a vacuum cleaner used for clean up during the job showed no air contamination resulting from this type of clean-up operation. Surface contamination of 1800 alpha c/m (950 c/m, wipe) was found on a rubber sheet which was used to prevent contamination of the floor. The sheet was carefully removed after the job and returned for decontamination. On this job, issued shoe and coverall contamination was found to range as high as 1440 alpha c/m. Protective equipment in the form of gloves, coveralls, issued shoes, head covers and assault mask was used by personnel.

K-312-2 Cold Trap Room

A survey of the servicing of three activated alumina traps showed air and surface contamination to be below tolerance during servicing operations.

K-1410 Building

A spot survey of dumping of a K-631 Building carbon trap at this location revealed alpha air contamination of 15.0 alpha c/m/ft³ during this operation. Surface contamination levels over a 200 ft² area increased as much as 1000 alpha c/m (900 c/m, wipe) over levels established before the work was begun. Coveralls, gloves, issued shoes, head covers, and assault masks were worn by personnel.

Field Decontamination

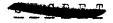
Four (4) decontemination jobs audited during the month were conducted in areas where surface contamination of from 500 to 18,200 alpha c/m (up to 15,000 c/m, wipe) had been measured. Coveralls, gloves, shoe covers, head covers and assault masks are worn during field decontamination jobs where considerable material is involved. Coveralls, issued shoes and gloves are used on small surface alpha decontamination jobs.

Valves removed from C-616 feed cylinders in the K-131 Building are placed in metal containers for moving to the K-1410 Building by Cascade Services operators. Beta-gamma radiation as high as 288.0 mrep/8 hrs at the surface of the valves is adequately shielded by the metal carrying container. These valves are stored in metal containers in the K-1410 Building awaiting decontamination.

Vacuum Test Jobs

K-303-2 Cell 6, Test Loop

A spot survey during the vacuum testing operation of a test loop piping showed no above background alpha airborne activity in the exhaust





of the vacuum pump during evacuation of the system. No surface contamination was detected.

K-1004-A Laboratory

Room 19-A (Sampling Section)

Two (2) spot surveys were conducted in this location during the month. The first survey conducted during the month revealed a decided increase in the number of locations found contaminated to above tolerance levels. Nineteen (19) spots were found to have above tolerance surface contamination. A maximum surface reading of 7500 alpha c/m (250 c/m, wipe) was found on the floor beneath a sink. Five (5) locations showed transferable material, a maximum wipe test reading of 300 alpha c/m being recorded. A later survey in this location indicated that some decontamination work had been accomplished. On this survey, twelve above tolerance surface readings were obtained. The maximum reading of 8000 alpha c/m was found on a pair of leather gloves lying on a table. Only one spot, a metal pan under the work bench, revealed transferable contamination. Sample cylinders stored in this location were found to read a maximum of 24 mrep/8 hrs of gamma radiation. Two air samples taken during the month revealed no air contamination.

K-1095 Critical Mass Building

Two (2) spot surveys were conducted during the month in this location. These revealed contamination of greater than 46,000 alpha c/m in Rooms 7 and 10. Several metal pans on work tables in Room 10 were contaminated to greater than 32,000 c/m (32,000 c/m, wipe). Gloves with counts as high as 12,500 alpha c/m on them were found on tables in Room 10. A metal pan under hood #4 in this location had several spots of visible material on it reading greater than 46,000 alpha c/m (46,000 c/m, wipe). Approximately 80 percent of the working area in Room 7 is highly contaminated. This room is used for storing contaminated equipment and consequently reveals high contamination levels. Several pans containing contaminated equipment were found in Rooms 7 and 10.

The maximum count recorded in Room #9 was 1500 alpha c/m (600 c/m, wipe). This activity was found on a rubber gasket. A total of six airborne alpha samples was taken in this building during the month. The maximum activity recorded was 0.36 c/m/ft^3 . Beta-gamma measurement taken in this building during surveys revealed below tolerance radiation levels.

The K-1095 Building has been shut down for a period of about two months with the exception of work being done in Room #10. During this shut-down period work tables in Room #10 have been painted and some





decontamination work accomplished. However, Rooms #7 and #10 remain highly contaminated as indicated in the above survey results.

Laboratory Non-Routine Surveys

Four (4) surveys were made by the laboratory surveyors on specific request of the Radio-Chemical Section. A 220 gallon tank and 8 waste cans were checked prior to shipment to X-10 on November 8 and 9. Three shipments were made. Three cans had above tolerance radiation at points on their surface. The tank had a maximum reading of 1.04 R/8 hrs at the tail gate of the truck. The drivers' cab was always well below 100 mr/day.

The highest reading at the surface of a waste can in the November 17 shipment was 240 mr/8 hrs. The highest reading on the 220 gallon tank shipped to X-10 on November 22 was 144 mr/8 hrs. Wipe tests all gave negative results.

Some equipment in the laboratory J restricted area was found to be contaminated to 1200 alpha counts/minute (100 c/m, wipe).

K-1004-D Laboratory, Room 20 (Wet Chemistry)

Above tolerance alpha contemination here was kept at a minimum through frequent radiation surveys followed by decontemination operations. Above tolerance radiation readings were found at the surfaces of sample containers. However, at working distances radiation was found to be below tolerance.

K-1004-D Laboratory, Rooms 05, 09 (Physical Chemistry)

A low level of activity continues to exist in these locations. Two air samples by Health Physics inspectors of the Radiation Hazards Department revealed activities slightly above the tolerance of 2 counts/min/cubic foot (maximum 2.93 c/m/ft³). It is believed that these apparently significant counts were the result of inaccurate data recorded in connection with the taking of these samples. One radiation reading above 100 mrep/8 hrs was due to a sample.

K-1004-J Laboratory

Air and alpha contamination continue at background levels. The 65 above tolerance readings reported by the laboratory survey group are due to samples, high activities at locations within waste cans, and the fact that readings are taken at closest approach. Although these radiating sources are not normally approached to unsafe distances for appreciable lengths of time, it would be highly desirable to shield these sources and/or confine them to fewer locations.



K-1301 - 216 Generation and Oxide Conversion Building

Four (4) spot surveys conducted in this building during the month continued to find high surface alpha contamination of which a large percentage was transferable. A maximum surface reading of >30,000 c/m (>30,000 c/m, wipe) was found on a table top in the Oxide Grind Room, and contamination of >30,000 c/m (9450 c/m, wipe) was found on floor surface here. This room was cleaned with a vacuum cleaner prior to a survey made on November 15, and a very noticeable decrease was found in both surface and wipe activity.

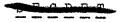
In the Oxide Weighing Room high alpha contamination exhibiting both surface and wipe activity was found. A maximum of >30,000 c/m surface activity (>30,000 c/m, wipe) was located on a weighing table. A maximum surface activity of 21,300 c/m (4500 c/m, wipe) was found on the floor.

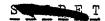
Surface contamination of 1420 c/m surface alpha (840 c/m, wipe) was found in Hallway between the Grind and Weigh Rooms and Conversion Room doors.

Air samples taken in this area were below the tolerance level. Beta-gamma surveys made in this location with a 2610 survey meter revealed above tolerance radiation on the oxide grinder in the Grind Room. Oxide material on the floor of the Weigh Room also exhibited above tolerance radiation. Maximum readings were 160 mrep/8 hrs in both rooms of which practically all was beta radiation. Operators working in these rooms have a limit (2 hours) for time spent within the area where above tolerance exposure might be possible.

The floor and equipment in the Conversion Room revealed a maximum of 30,000 alpha c/m (7500 c/m, wipe). This room was decontaminated on November 12 and, when checked on November 15, had a maximum reading of 7100 alpha c/m (1820 c/m, wipe). A reading of 27,000 alpha c/m (4050 c/m, wipe) was found on a work bench surface in the work shop of the K-1301 Building. This bench has been decontaminated.

Visitor control signs are posted on doors to the Grind, Weigh and Conversion Rooms. Operators in these locations wear protective coveralls, head covers, company issue shoes, leather palm gloves and assault masks or respirators when working with oxide materials. A time limit is also observed by operators working in Oxide Grind, Weigh and Trensfer Rooms to minimize the hazards to which the operators are exposed. Hand counts are taken and recorded at lunch time and at end of shift by all personnel in this area.





K-1303 Cubicles and Recovery

Six (6) spot surveys were made in these cubicles during month. The first four surveys found above tolerance alpha contamination in all cubicles except #8. Cubicles #*s 11 and 12 had readings in excess of 27,000 c/m; wipe activity in #11 was >27,000 c/m.

All cubicles with the exception of #1s 5 and 7 were decontaminated with acid after the survey made on November 11, and prior to the survey of November 16. The survey made on November 16 revealed that surface contamination had been reduced from >30,000 c/m to a maximum of 4260 c/m (280 c/m, wipe). Only one floor surface area in the ten cubicles decontaminated was found to have transferable contamination.

After the November 16 survey, all cubicle floor, wall and ceiling surfaces, with the exception of cubicle #5 and #7 surfaces were painted, and when checked again on November 19, only one spot (of approximately 2 ft² in cubicle #3 on floor) revealed surface contamination. This floor area showed 1260 c/m of surface activity.

K-1303 Yard

A spot survey was made of outside contamination around centrifuge recovery unit and receiving tower. Crushed rock at the base of the receiving tower had a maximum of 1260 alpha c/m; the base of the receiving tower, 1400 alpha c/m. Platform steps at the centrifuge unit had a surface alpha contamination of 5680 c/m (280 c/m, wipe). Since this survey was made, all working areas around acid and water loops and the recovery units have been covered with fresh crushed rock.

K-1303 Converter Decontamination Building

Eight (8) spot surveys were made in this building during the month. The floor grating installed during last month has minimized the spread of contamination to a great extent. Regular decontamination in this room has cut down surface contamination, and in some parts of room where surface contamination is still above tolerance, wipe activity has been reduced to less than 100 c/m.

Although improvements in this area are evident as noted above, surveys during the month revealed approximately 600 ft² of floor and work surface area, and some equipment to have above tolerance alpha contamination of greater than 30,000 alpha c/m (greater than 30,000 c/m, wipe). Air samples taken in this room revealed below tolerance air activity.

Operators in this section wear coveralls, gloves, company issue shoes or shoe covers, and respirators while dismantling converters.





Hand counts are taken at lunch time and at end of shift. Spot checks of coveralls and shoes worn by operators revealed contamination as high as 420 c/m on coveralls and 1120 c/m on shoes. All protective clothing is changed before leaving the restricted area, and strict controls are in force preventing entry by personnel not properly protected.

K-1401 Building

Vacuum Pump Shop

Five (5) surveys were made in this shop during the month. Several above tolerance alpha surface and wipe counts were found during the first part of the month, the highest of these being 18,000 and 7200 alpha c/m respectively. Steel tops have been installed on all work benches and tables to provide greater ease of decontamination. Surveys conducted after this installation showed a decided improvement in alpha contamination levels. An exhaust hood was installed over the degreasing ramp. Airborne sampling revealed normal background air activity during the month.

A. C. Pump and Seal Shop

A total of six (6) audits was made in this shop during the month. A maximum count of 26,000 alpha c/m (1950 c/m, wipe) was found on a seal which had been sent to the shop for reworking. Of a total of six (6) airborne samples taken, only one showed a count of above normal background. This sample showed 3.2 alpha c/m/ft 3 . It was taken while a contaminated seal was being removed from a container. Work is being carried out in accordance with prescribed protective measures recommended for seal decontamination and repair in this shop.

Retubing Area

Two (2) surveys were made in this location during the month. One above tolerance reading of 4171 alpha c/m (165 a/m, wipe) was found on an open flange of a converter head. Airborne sampling during tube disintegration operation revealed normal background air activity levels.

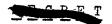
Ferrule Knockout

Two (2) surveys were made here during the month. Only two (2) above tolerance locations were noted, the highest contamination being found on a seal pressure plate showing a count of 2100 alpha c/m (700 c/m, wipe). All airborne activity samples were at background levels.

Cleaning Area

Nine (9) surveys were conducted in this area during the month. The majority of these surveys were made on converter heads and shells coming





from the K-1303 decontamination area. The highest count recorded was 32,300 alpha c/m (1200 c/m, wipe). This was found on the "B" opening of a converter head. All items found to be above tolerance were decontaminated in the cleaning area or returned to K-1303.

K-1410 Contaminated Equipment Storage

Three (3) spot surveys were made at this location during the month. The high level of contamination previously reported for this location remains unchanged. Alpha surface activity of up to 8400 alpha c/m (1900 c/m, wipe) was found. Beta-gamma radiation of 160 mrep/8 hrs was found at the surface of unidentified material in a metal container and on screens that had been removed from carbon traps. A maximum reading of gamma radiation was 4 mr/8 hrs. Air samples taken here showed air contamination of 0.18 alpha c/m/ft³.

Contaminated equipment is being stored here awaiting decontamination. Contamination of the building is caused by the contaminated equipment and operations involving handling of contaminated carbon. A clean up of the building has been begun, and salvage items with a low level of surface contamination are being moved to the Hot Salvage Yard.

Signs are posted at all entrances listing the personnel protection rules in force, for both regular employees and occasional visitors. No eating or smoking is permitted in the building.

Tool Rooms

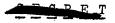
K-303-4 Tool Room

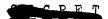
A survey of this room during the month showed that contaminated tools are getting back into the tool room while not identified as contaminated. Three (3) crescent wrenches found in the regular distribution bin showed a surface alpha count as high as 24,000 c/m (1500 c/m, wipe). Three (3) putty knives also showed a high surface count of 2400 c/m.

A suggestion was made to the tool room supervisor that a check be made of all tools which have been used on contaminated equipment before they are returned to the bins for reissue. An alpha zuto meter is furnished this tool room for this purpose.

K-1401 Tool Room

No contamination was found on approximately one thousand (1000) miscellaneous tools checked in this tool room.





V. PERSONNEL MONITORING

Hand Counts

Personnel monitoring in the form of hand checks for alpha contemination continues to be accomplished throughout the plant in locations where personnel are subject to contamination by virtue of the work they perform. Reported routine hand monitoring data for November is as follows:

Location	Approx. No. of Employees Monitored Daily	Type of Monitoring		nal Readings ove Tolerance
K-300 Coded Chemical Vault 16-A	7	Alpha	Twice daily	0
K-301-4 Field Electronics Shop	22	Alpha	Twice daily	0
K-303-7 Change House	18	Alpha	Twice daily	0
K-305-9 RR AREA Operating Personnel	27	Alpha	Twice daily	0
K-305-9 Field Electronics Shop	6	Alpha	Twice daily	0
K-1004-J Radio- Chemical Laboratory (Visitors & Regular)	50	Alpha Beta-gamma	On leaving	0*
K-1004-D, Room 20 Wet Chemistry Section	n 6	Beta-gamma	On leaving	0
K-1004-B, Room 150 Counting Section	5	Beta	Twice daily	0
K-1004 Laboratory Sampling	10	Alpha	Twice daily	0
Uranium Analysis	19	Alpha	Twice daily	0

^{*} Latest data received November 15

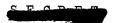
Location	Approx. No. of Employees Monitored Daily	Type of Monitoring	Minimum Frequency	Final Readings Above Tolerance
K-1004 Laboratory	<u>.</u>			
Electronics	8	Alpha	Twice daily	0
Counting	18	Alpha	Twice daily	0
Spectrometer	54	Alpha	Twice daily	0
K-1024 Pneumatic Instrument Shop	10	Alpha	Twice daily	0
K-1301 and K-1303 Oxide Conversion & Decontamination and Recovery	47	Alpha	Twice daily	4
K-1401 A. C. Pump and Seal Shop	6	Alpha	Twice daily	0
K-1401 Vacuum Pump Shop	28	Alpha	Twice daily	0
K-1401 E T & I Shop	1	Alpha	Twice daily	0
Converter Change Personnel	40	Λlpha	Upon leaving	o o

In addition to the hand checks which are formally recorded twice each shift, additional checks are made whenever they are considered necessary by the employee or supervisor.

Film Badges

An average of 334 film badges was used each week throughout the K-25 Plant during the period October 22 to November 26. Use of badges was divided as follows:

	Stationary	Personnel Personnel
Critical Mass Laboratory (Including Visitors)	3 -	12
Emergency Monitoring	16	0 -
Engineering Development	3	0





	Stationary	Personnel
Health Physics Inspection Section	11	13
Instrument Development Section	0,	4
Laboratory Division (Including Visitors)	5	116
Process Division	42	78
Plant Protection Division	0	26
Electronic Instrument Department	Ö	3
Maintenance Division	0	2
	80	254

Thirty-three (33) badges were issued weekly for use by visitors in the Laboratory Division and the Critical Mass Laboratory.

There were no above tolerance beta-gamma exposures to personnel recorded during this period.

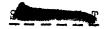
Film Rings

Thirty-five (35) film rings were used weekly by the Laboratory Division. No above tolerance beta-gamma exposures to personnel were noted during the month.

Pocket Chambers

Pocket chambers are worn daily by personnel working in or visiting the following locations:

Location	People	er of Wearing Chambers	Pairs Pocket Chambers Used	No. of Exposures Between 5 & 100 mr/day	No. Above Tolerance (100 mr/day)
K-1004-A, Room 22 Electrochemical Section		No	data rep	orted	
K-1004-J, Radio- Chemical Labora- tory - Visitors Reg. Person	nel	No	data rep 228	orted 49	0



Location	Number of People Wearing Pocket Chambers	Pairs Pocket Chambers Used	No. of Exposures Between 5 & 100 mr/day	Tolerance
K-1004-D, Room 20 Wet Chemistry Section	8	92	1	0
K-1004-D, Room 22 Physical Chemistry Section	4	56	3	o
K-1034, Radiation Hazards Dept., Healt Physics Section	h 4	40	1	0

VI. RADIOACTIVE MATERIAL RELEASES

K-1405 - November 3, 1948

An estimated 0.25 pounds of C-616 vapor was released from an operating system when a copper tubing connection sprang a leak. The area was not well lighted and when fumes were first noticed they were erroneously identified as vacuum pump oil fumes. Fifteen minutes later correct identification was made and the C-616 was valved off. By this time the fumes, which had been escaping slowly, were generally diffused throughout the room, though no visible deposition had occurred at any point near the break. The occupants of the room, seven in all, were sent to the dispensary. No decontamination was attempted since the room was being prepared for painting to cover contamination previously found incapable of removal.

K-402-4 Crude Feed Filter Housing - November 3, 1948

At about 11:20 p.m. a leak developed in the crude feed filter allowing C-616 vapor to escape into the housing surrounding this installation, thence through the emergency exhaust fan to the atmosphere of the K-402 pipe gallery. The leakage continued for an estimated twenty minutes, during which time an indeterminable amount of material entered the enclosure. As soon as the area had been thoroughly ventilated air samples were taken. The highest reading obtained was at a point within the housing eighteen feet from the filter. The airborne activity was 3.8 c/m/ft³. Surface contamination was present both within the enclosure and on external surfaces. Visible accumulations were present on inside surfaces of the filter housing. Three employees who had entered



the pipe gallery during the release were sent to the Dispensary for supervisory examinations. The affected area was roped off, and decontamination was performed successfully on the following morning.

K-131 Pump Room - November 18, 1948

A small but visible quantity of C-616 material was released to the atmosphere for about 30 seconds when a leak developed at a faulty test connection during an instrument pressure test operation. Process gas from a purge leader escaped into the room causing airborne alpha contamination of which the highest measured amount was 7.5 c/m/ft³. Surface and wipe alpha readings made in the surrounding areas were unable to locate any detectable contamination. A brief beta-gamma survey also gave negative results. Three employees, who had been in the immediate vicinity, were sent to the Dispensary for supervisory examinations.

VII. AREA WATER MONITORING PROGRAM

During the month a better correlation between water sample collection and weather conditions was attained. Samples which might be influenced by rainfall were taken immediately following heavy rains. Results from the limited number of samples taken indicate no tendency towards higher uranium concentrations after heavy rainfalls than that observed during the dry summer months. The practice of taking samples after rainfalls will be continued, and additional data should provide more dependable information.

The continuous sampler at the Senitary Water Plant operated satisfactorily throughout the month. A higher average beta activity was recorded for the month than the average recorded in previous months. This increased activity may be attributed to a possible release of greater quantities of beta-gamma emitting waste at X-10 due to heavy rainfall. The reported value for the month remains below accepted estimates of maximum permissible concentrations of beta-gamma emitters in water.

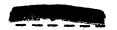
VIII. SPECIAL STUDIES

Disposal of Combustible Contaminated Waste

During the month a survey was made of present methods of collection and disposal of combustible contaminated waste at various locations in the plant. The survey indicates that an overall waste handling program is required. Such a program is now receiving consideration.

Test of Shipping Container

A concrete-lined drum intended as a shipping container for radioactive materials was checked by Radiation Hazards personnel to determine whether





shielding characteristics were adequate. A 50 mg radium source and Geiger-Muller type instruments were used in the test.

Instrument Development

Field testing of a newly developed model of a two fold alpha hand counter was begun during the month. Present results indice a that this instrument is a reliable and comparatively inexpensive hand counter having a possibility of wide application in the plant.

The radiation detection instrument construction and procurement program is progressing as scheduled. Eighteen Poppy alpha detectors of new design having preamplifier poppy probes were completed and are being distributed in the plant.

IX. EDUCATIONAL PROGRAM

During the month training of the plant emergency squads in radiation hazards was commenced. Two six-man squads for each shift (a total of eight squads) were to receive training. Fire Department and Plant Protection Division personnel were also to attend training sessions. Each group trained during the month received two two-hour periods of training, including basic theory in atomic structure and radiation, plant protective devices and procedures, precautions to be observed, and meter operation principles and usage. Six squads completed training during the month, a total of forty-eight persons including firemen and guards.

